JWAI203/JWAI204

802.11 b/g/n AP Router

User Manual

Version 1.6

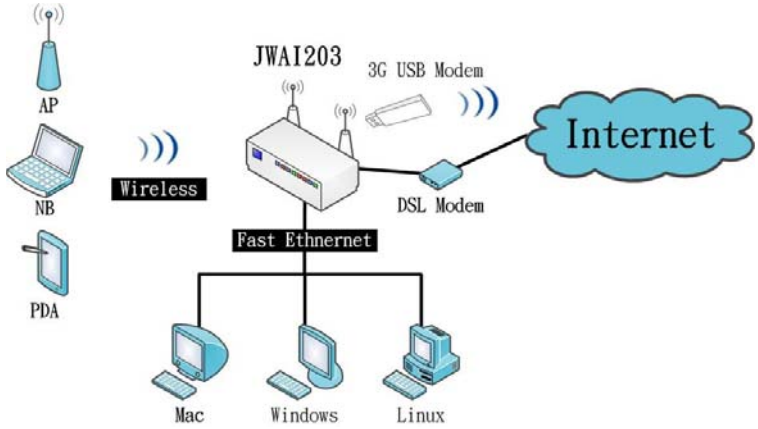
TABLE OF CONTENTS

Chapter 1 Introduction....4
1.1 Package Contents....4
1.2 Features....4
1.3 Specification....6
1.4 Physical....7
Chapter 2 Hardware Installation....9
2.1 Overview....9
2.2 Hardware Installation....9
Chapter 3 PC Configuration....11
Chapter 4 System....13
4.1 Operation Mode Configuration....13
4.2 Status....13
Chapter 5 Wireless Access Point....15
5.1 Operation Mode....15
5.2 Internet Setting....15
5.3 LAN Setting....19
5.4 Wireless Setting....21
5.5 Advanced Setting....24
5.6 WMM configuration....26
5.7 WDS configuration....27
5.8 QoS....30
Chapter 6 Wireless Security....33
6.1 Encryption Setting....33
6.2 WEP-OPEN/SHARED/AUTO....34
6.3 WPA/WPAWPA2....35
6.4 WPA-PSK/WPA2-PSK/WPA-PSKWPA2-PSK....35
6.5 WPA2....36
6.6 802.1x....37
6.7 MAC Access Control....38
Chapter 7 WPS....39
7.1 WPS-PIN setting....39
7.2 WPS-PBC setting....39
Chapter 8 Storage....41
8.1 User admin....41
8.2 Disk Management....42
8.3 FTP Server setting....43
8.4 SAMBA Server setting....44
8.5 Bittorrent setting....46
Chapter 9 System Management....50
9.1 Management....50
9.2 Settings backup & restore....51
9.3 Firmware Update....53
9.4 Statistic....54
Chapter 10 Bridge mode....55

Chapter 11 AP + Client 56
Chapter 12 Client 57

Chapter 1 Introduction

The AP Router is an IEEE802.11 b/g and 11n draft 2.0 AP Router. AP Router is a multi-function wireless AP Router, it support 1-port WAN 4-port LAN 10/100 BaseT Switch Hub and 1-port USB Host. This manual describes the details of how to configuration and manage this equipment.



1.1 Package Contents

Make sure that you have the following items:

- 802.11 b/g/n AP x 1
- Power Adapter x 1 (12V 2A)
- SMA Antenna x 2
- User Manual CD x 1
- Quick Installation Guide x 1

Note: If any of the above items are missing, contact your supplier or local dealer as soon as possible.

1.2 Features

Internet Features

- Internet connection type: static IP ,DHCP Client ,PPPOE,PPPTP,LITP,3G.

Router Features

- DHCP Server and Client.
- NAT (Network Address Translation).
- ICMP (Internet Control Message Protocol).
- IGMP (Internet Group Management Protocol).
- DDNS (Dynamic Domain Name Service).

Wireless Features

- Supports WDS, AP, AP Client, Repeater, Bridge mode for wireless networks.
- Compatibility with IEEE 802.11g, 802.11b (2.4GHz) and 802.11n (draft 2.0) standards.
- Superior wireless coverage and high performance, up to 300Mbps for wireless data rates.

Management Features

- Firmware upgrade via HTTP.
- WAN and LAN side connection statistics.
- Configuration of static routes and routing table.
- PPP user ID and password.
- System Logs.

Security Features

- Password protected configuration access.
- User authentication (PAP / CHAP) with PPP.
- Support 64/128-Bit WEP, WPA-PSK, WPA2-PSK, WPA-RADIUS, WPA2-RADIUS, WPS and 802.1x.
- MAC Access Control.
- Support IP tables firewall, MAC / IP / PORT filter, DMZ virtual server, SPI firewall.

Ethernet Features

- Compliant with IEEE 802.3 and 802.3u 10/100 Mbps.
- All Ethernet ports support auto-crossover (MDI/MDI-X),1 X WAN port, 4 X LAN port.

Quality of Service (QoS) Features

- IEEE 802.11e QoS.
- Wi-Fi Alliance WMM (Wi-Fi Multimedia Enhancement),QoS-WMM support.

External USB Storage Features

- 1 X USB port (Host).
- External USB Storage device.
- 3G modem card.

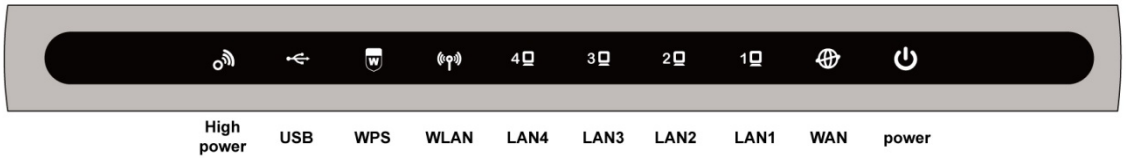
1.3 Specification

Category	Item	Description
Product General	Standards	Wireless: IEEE 802.11b/g/n Ethernet: IEEE 802.3/u (10/100BaseTx)
	Data Rate	802.11b: Up to 11 Mbps 802.11g: 54Mbps; 802.11 n:300Mbps
	OS Supported	Linux
Physical Spec.	Dimension	L x W: 140x90mm
	Interface	1 x WAN Automatic MDI/MDIX (WAN) –POE power 4x LAN Power Jack: 2.1 mm (inner size) Default Reset Button+ WPS Button USB (host) Jtag UR LED heater
	Antenna Type	1/2 X SMA connecter
Hard Ware	Chipset	CPU MIPS 384Mhz: RT3050/RT3052 RF: RT3050/RT3052 PA: JA2508
	Memory	Flash: 4MB support up to 8MB SDRAM: 16MB (16bit x1) up to 32MB
	LED	Power/Status: steady green WLAN: green for wireless connectivity / activity WAN Network: green for link; blink for activity LAN WPS USB High power
	Frequency Range	2412 ~ 2462 MHz (N.A) 2412 ~ 2472`MHz (EU) 2412 ~ 2472 MHz (Japan)
	Opt. Channel	1 ~ 11 channels (North America) 1 ~ 13 channels (General Europe) 1 ~ 13 channels (Japan)
	Emission Type	DSSS / OFDM
	Output Power	11b/g: 6Mbps@ 23±1.5dbm 36Mbps@22±1.5dbm 48Mbps@21±1.5dbm 54Mbps@20±1.5dbm
	Sensitivity of 802.11b	1, 2 Mbps (BPSK, QPSK): - 98 dBm 5.5 Mbps (CCK): - 88 dBm 11 Mbps (CCK): -84 dBm (typically @PER < 8% packet size 1024 and @25ºC + 5ºC)
	Sensitivity of 802.11g	54Mpbs (64QAM): -74dbm 48Mbps (64QAM): -76dbm 36Mpbs (16QAM): -78dbm 24Mbps (16QAM): -80dbm 18Mbps (QPSK): -81dbm 12Mpbs (QPSK): -82dbm 9Mbps(BPSK): -85dbm 6Mbps (BPSK): -92dbm (typically @PER < 10% packet size 1024 and @25ºC + 5ºC)
	Frequency Stability	within +20 ppm

	Data Modulation Type	BPSK, QPSK, CCK and OFDM
	Power	DC or positive POE 12-18V@1A
Maximal Wireless Users		254
Recommended Wireless Users		64
Software Features	Standards & Protocol	As Ralink SDK
	Security	As Ralink SDK
	Configuration & Management	As Ralink SDk
	Operation mode	AP, AP+client, Bridge. Client
Regulation and Compliance	US	FCC Part 15 class B
	Europe	ETS 300 328, ETS 301 489-1&17, and CE Mark EN 60950, EN 55022 Class B, EN 50082-1 1998
Environment Spec.	Operating Temp	0℃-50℃
	Storage	0ºC ~ 50ºC
	Humidity	5%~98% non-condensing

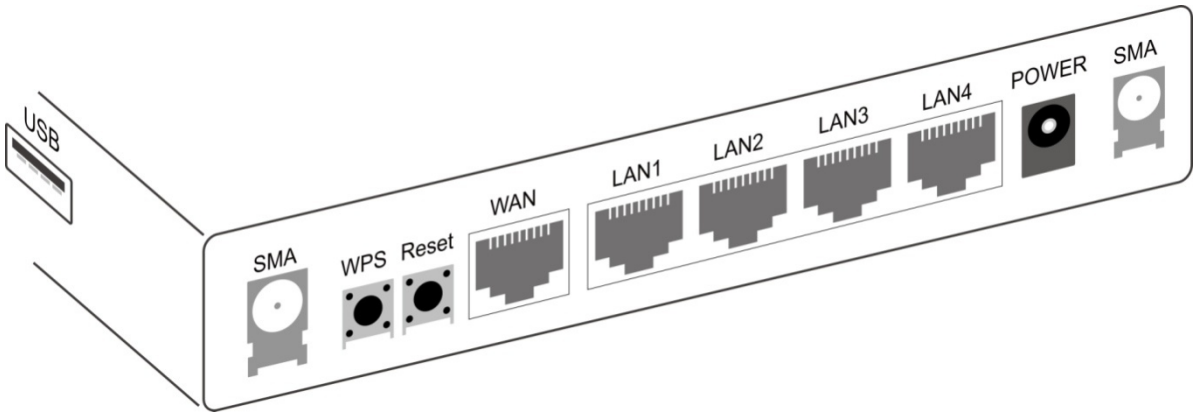
1.4 Physical

Front Panel LEDs



Power	Show Power on or off.
WAN	Show AP Router yes or no connect to DSL modem.
LAN1/2/3/4	Show LAN port is active.
WLAN	Show Wireless Radio on or off.
WPS	When WPS LED spark then it show WPS-PBC mode is operating and waiting for Wireless client to authorization requests.
USB	Show 3G modem is enable.
High Power	Show AP Router TX power in High Power mode(Full Power).

Back Panel

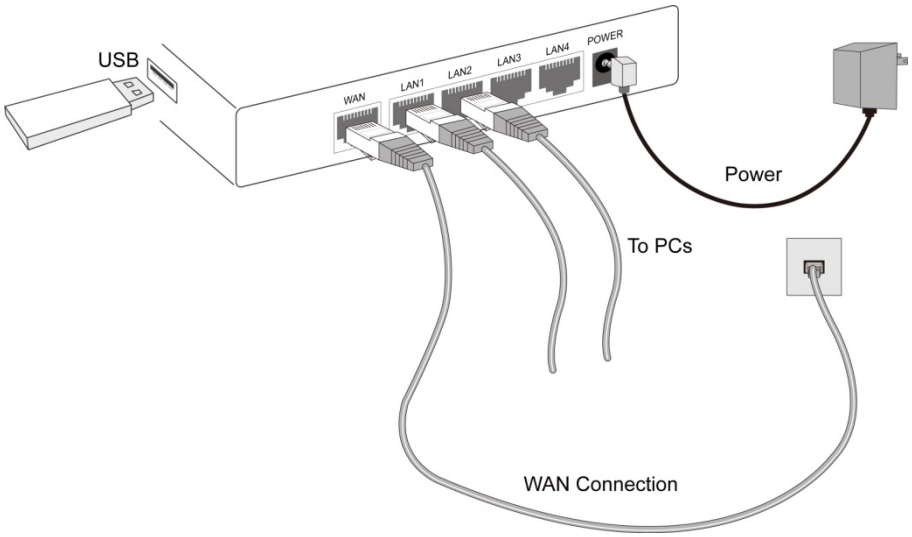


SMA	Wireless connector type is SMA Jack. Connect external antenna here.
Power	Connect the supplied power adapter here.
WAN Port	10/100 BaseT fast Ethernet connector. Connect the DSL or Cable Modem here. If your modem came with a cable, use the supplied cable. Otherwise, use a standard LAN cable.
LAN Port	10/100 BaseT fast Ethernet connector. Use standard LAN cables (RJ45 connectors) to connect your PCs to these ports.
Reset	Reset your AP setting to factory default.
WPS	WPS-PBC button.
USB	External USB port(Host).Connect USB device here.

Chapter 2 Hardware Installation

This chapter is to hardware installation.

2.1 Overview



Requirements
■ Network cables. Use standard 10/100BaseT network (UTP) cables with RJ45 connectors.
■ Network Interface card (NIC 10/100Base T). Need to install on all PCs.
■ TCP/IP protocol must be installed on all PCs.
■ For Internet Access, an Internet Access account with an ISP, and a DSL connection or 3G/3.5G USB modem card.
■ To use the Wireless Access Point, all Wireless devices must be compliant with the IEEE.
■ 802.11g, IEEE 802.11b or IEEE 802.11n Draft specifications.

2.2 Hardware Installation

A. Choose a place site

Select a suitable place on the wireless environment to place the AP Router.

Notice: For best Wireless reception and performance, the AP Router should be positioned in a central location with minimum obstructions between the Wireless Router and the PCs. Also, if using multiple Access Points, adjacent Access Points should use different Channels.

B. Connect LAN Cables

Use standard LAN cables to connect PCs to the Switching Hub ports on the AP Router. Both 10BaseT and 100BaseT connections can be used simultaneously.

C. Connect Internet

- WAN Port:

Connect the DSL or Cable modem to the WAN port on the AP Router. Use the cable
supplied with your DSL/Cable modem. If no cable was supplied, use a standard cable.

- USB Port:

Connect the 3G/3.5G USB modem card or USB storage device to USB port on the AP Router.

D. Power ON

Connect the supplied power adapter to the AP Router. Use only the power adapter provided. Using a different one may cause hardware damage.

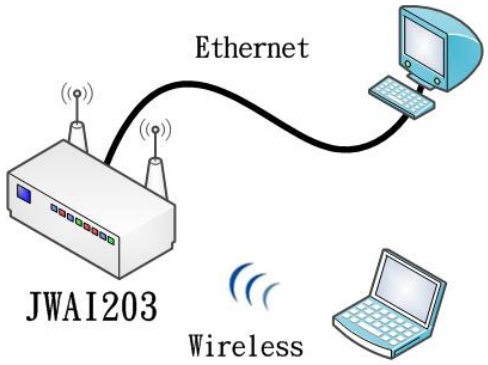
E. Check LEDs

The Power LED should be ON.
The WAN LED should be ON if ADSL line is connected.
The LAN LED should be ON (provided the PC is also ON.)
The WLAN LED should be ON if Wireless PC is connected.
The USB LED may be ON. When 3G modem is connected and dial out.

Chapter 3 PC Configuration

AP Router contains an HTTP server, it should be configured the devices with the proper configuration. All the configuration process can only be operated with Web browser such as Microsoft Internet Explorer or Firefox from the PC. The following chapters will show how to setup this device to a proper configuration.

1. Connect PC with AP Router through Ethernet or wireless.



2. Execute web browser on the PC which connect to the ***AP Router***.
3. Enter the IP address of the ***AP Router*** in the address field.
   Default IP Address: **Http://192.168.1.1**

4. The login page will show up. Enter User Name/Password in the login page.
   Default User Name/Password: **admin/admin**

Notice: The PC's IP address should be on the same IP subnet as the *AP Router*. Please refer to the following instruction to manually assign the IP address of PC.

1.

Windows® Vista ➔Click on *Start* > *Control .Panel* > *Network .and.Internet* > *Network .and .Sharing .Center* > *Manage Network Connections*.

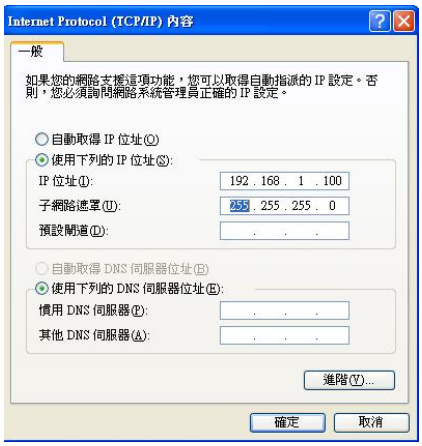
Windows® XP ➔Click on *Start* > *Control .Panel* > *Network Connections*.

Windows® 2000 ➔ From desktop right-click *My Network Places* >*Properties*.

2. Right-click on the *Local Area Connection* which represents your network adapter and selects *Properties*.

3. Highlight *[Internet Protocol (TCP/IP)]* and click *Properties*.

4. Click *[Use the following IP address]* and enter an IP address which is the same subnet as your AP. (Because the AP´s default LAN IP address is 192.168.1.1, make PC's IP address as **192.168.1.X** where X is a number between 2 and 254. Make sure that the number choose is not in use on the network.



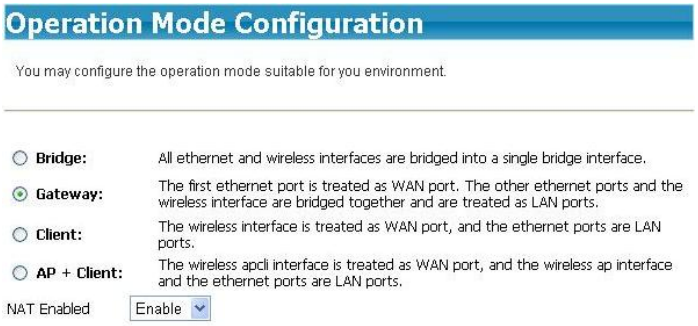
5. Click [OK] twice to save your settings.

Chapter 4 System

System item can configure AP Router operation mode and select language. The status page shows the current status and some basic settings of the device, includes system information, Ethernet port status detects.

4.1 Operation Mode Configuration

AP Router supports Bridge, Gateway, Client, AP Client, operation mode you may configure the operation mode for your Network environment.


Operation Mode Configuration
You may configure the operation mode suitable for you environment.
Bridge:
All ethernet and wireless interfaces are bridged into a single bridge interface.
Gateway:
The first ethernet port is treated as WAN port. The other ethernet ports and the wireless interface are bridged together and are treated as LAN ports.
Client:
The wireless interface is treated as WAN port, and the ethernet ports are LAN ports.
AP + Client:
The wireless apcli interface is treated as WAN port, and the wireless ap interface and the ethernet ports are LAN ports.
NAT Enabled
Enable

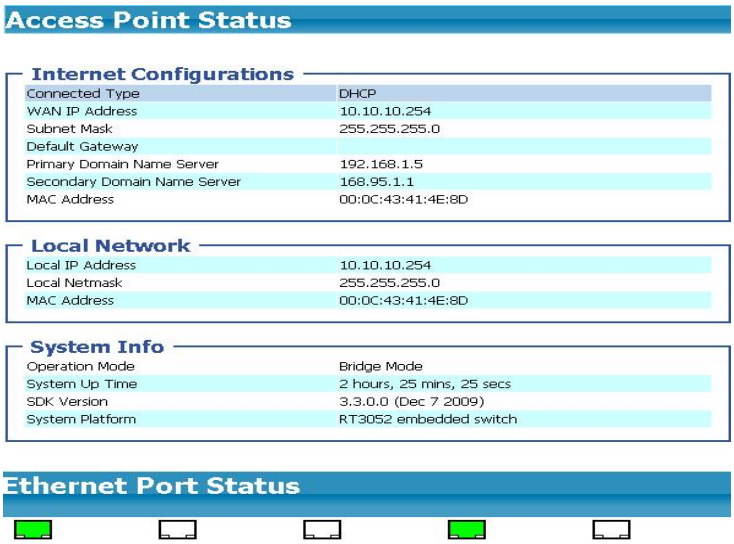
Operation Mode Configuration

Bridge	All Ethernet and wireless interfaces are bridged into a single bridge interface.
Gateway	The first Ethernet port is treated as WAN port. The other Ethernet ports and the wireless interface are bridged together and are treated as LAN ports.
Client	The wireless interface is treated as WAN port, and the Ethernet ports are LAN ports.
AP + Client	The wireless apcli interface is treated as WAN port, and the wireless AP interface and the Ethernet ports are LAN ports.

4.2 Status

It can display Internet connect configuration information and Local Network

IP information and. It can be detected Ethernet port status.



Internet Configurations

Connected Type	WAN port Internet connection type.
WAN IP Address	Internet WAN IP address get form your ISP.
Subnet Mask	Internet subnet mask information. The subnet mask get form your ISP.
Default Gateway	Internet Gateway information. Gateway information get form your ISP.
Primary Domain Name Server	Internet Primary DNS information get form your ISP.
Secondary Domain Name Server	Internet Secondary DNS information get form your ISP.
MAC Address	AP Router AP WAN port MAC address.

Local Network

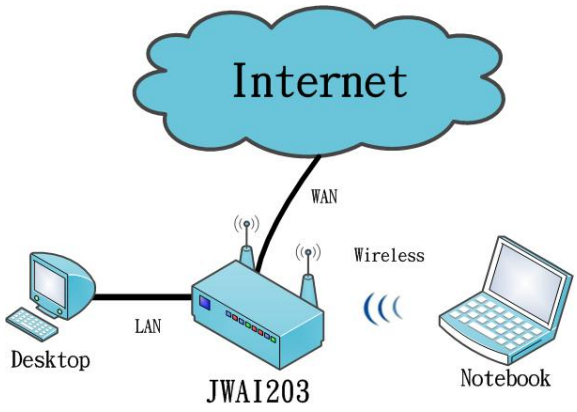
Local IP Address	AP Router AP Local LAN IP address.
Local Netmask	AP Router AP Local LAN subnet mask.
MAC Address	AP Router AP Local MAC address.

System Info

Operation Mode	AP Router AP operation mode.
System Up Time	AP Router AP Power turn on time.
SDK Version	AP Router AP firmware SDK version.
System Platform	AP Router AP hardware platform information.

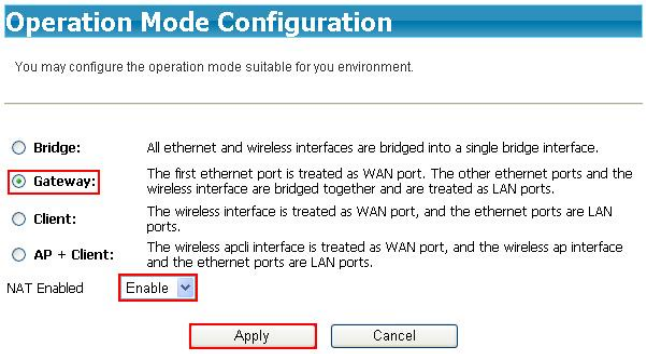
Chapter 5 Wireless Access Point

The chapter teaches how to configuration AP Router has Wireless Access point function. As long as follow this steps.



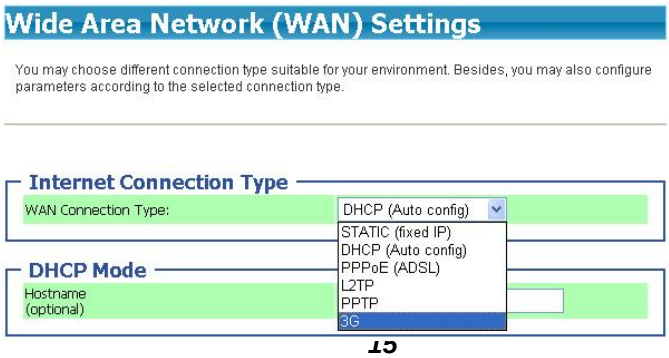
5.1 Operation Mode

AP Router Wireless Access Point function must be choose operation mode in Gateway mode. The set up step as follow: Operation mode selects [Gateway], NAT select [Enable], click [Apply].


Operation Mode Configuration
You may configure the operation mode suitable for you environment.
Bridge: All ethernet and wireless interfaces are bridged into a single bridge interface.
Gateway: The first ethernet port is treated as WAN port. The other ethernet ports and the wireless interface are bridged together and are treated as LAN ports.
Client: The wireless interface is treated as WAN port, and the ethernet ports are LAN ports.
AP + Client: The wireless apcli interface is treated as WAN port, and the wireless ap interface and the ethernet ports are LAN ports.
NAT Enabled
Enable
Apply
Cancel

5.2 Internet Setting

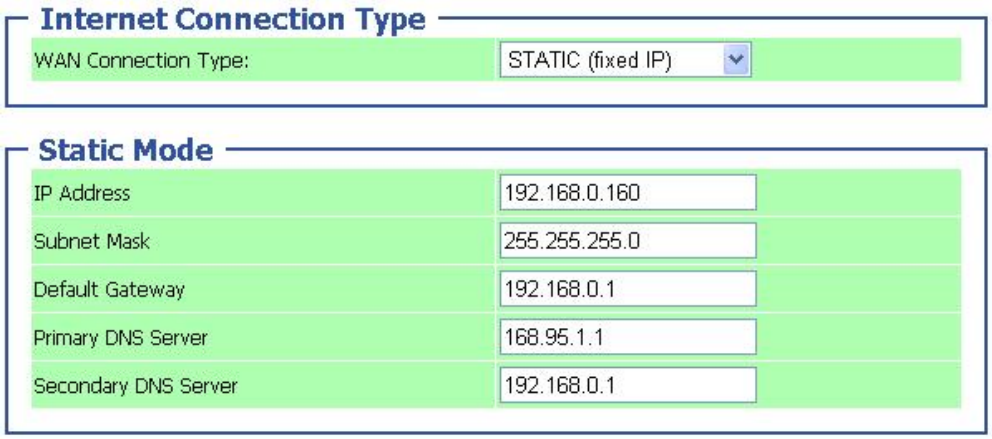
AP Router support 6 Internet connection type to deal different ISP environments.



WAN Connection Type

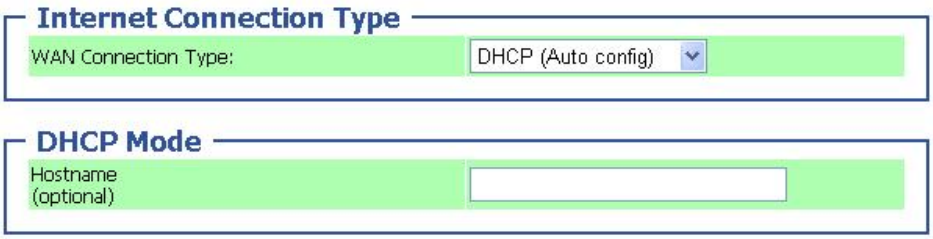
DHCP(Auto config)	When you connect to your ISP the automatically assign an IP address.
STATIC (fixed IP)	Your ISP allocates a permanent IP Address to you.
PPPoE (ADSL)	You connect to the ISP only when required. The IP address is usually allocated automatically.
L2TP, PPTP	You can choose it when you connect to Internet by VPN tunnel.
3G	When you connect to internet by 3G USB Network card select it.3G must be operated in **Gateway** mode.

STATIC (fixed IP)



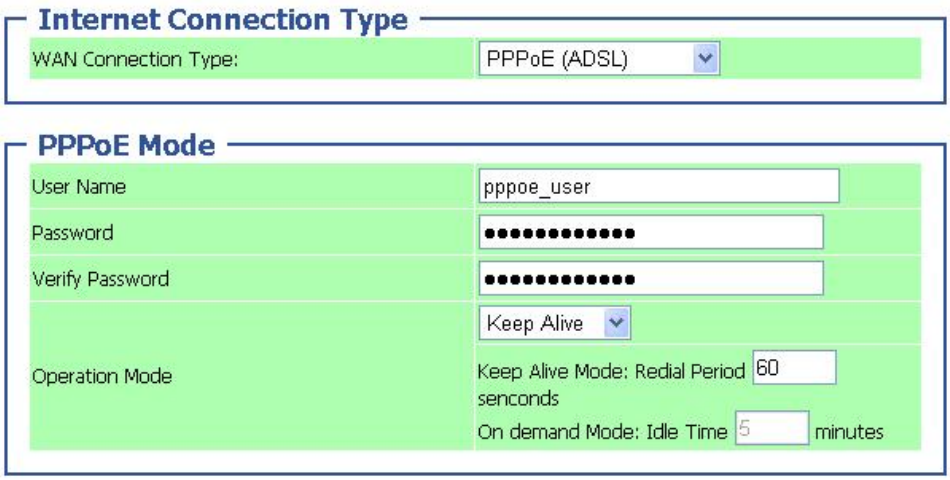
IP Address	Your IPS assign a static (fixed IP) IP Address to you.
Subnet Mask	Follow Your ISP Internet environments. The default value 255.255.255.0 is standard for small (class "C") networks. For other networks, use the Subnet Mask for the LAN segment to which the Wireless Router is attached (the same value as the PCs on that LAN segment).
Default Gateway	Follow Your ISP Internet environments. The IP address of the remote Gateway or Router associated with the IP Address above.
Primary DNS Server	Follow Your ISP Internet environments. The IP address of the Domain Name Server which is currently used.
Secondary DNS Server	The IP address of the Domain Name Server which is currently used. Follow Your ISP Internet environments to setting secondary DNS server.

DHCP (client)



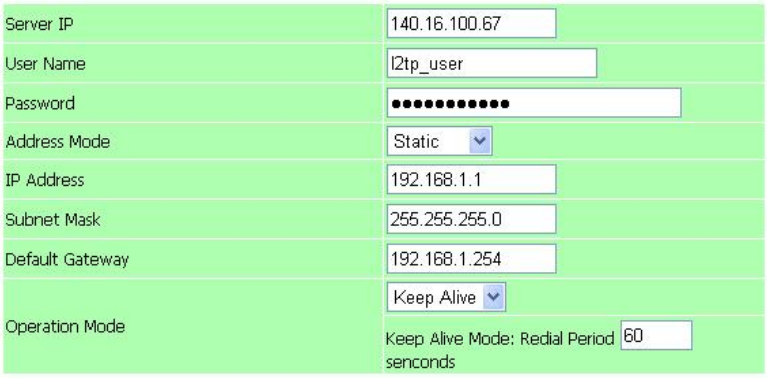
DHCP(Auto config)	When you choose DHCP (Auto config) to connect Internet your ISP will automatically assign an IP address to you.
Hostname (optional)	Setting your AP Router Hostname in Network.

PPPoE (ADSL)



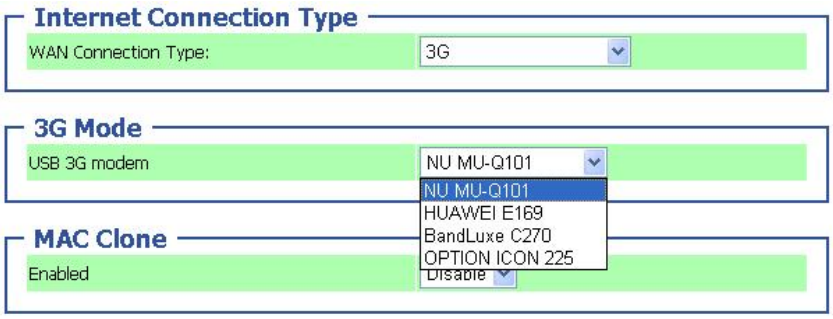
User Name	Login Internet username ask for your ISP.
Password	Login Internet password ask for your ISP.
Verify Password	Verify your Internet login password again.
Operation Mode	PPPoE dial mode: ■ **Keep Alive:** When AP Router is power on, then PPPoE always on line. Default redial period time is 60 seconds. ■ **On Demand:** When you connect Internet, then PPPoE will dial to your ISP. Default dial to cut off time is 5 minutes, when connect idle 5 minutes. ■ **Manual:** When you power on AP Router then PPPoE automation dial to Internet. When connect idle 5 minutes then PPPoE connection will dial to cut off.

VPN (L2TP / PPTP)



Server IP	VPN server IP address you need to ask your VPN service provider.
User Name	Login your VPN server username need to ask your VPN service provider.
Password	Login your VPN server password need to ask your VPN service provider.
Address Mode	VPN IP assign type: ■ **Static:** VPN tunnel IP assign used a static IP, user need to setting IP. ■ **Dynamic:** VPN tunnel IP used assign automatically, user don't setting IP.
IP Address	Your VPN service provider assigns a static IP Address to you.
Subnet Mask	The default value 255.255.255.0 is standard for small (class "C") networks.
Default Gateway	The IP address of the remote Gateway or Router associated with the IP Address above.
Operation Mode	VPN dial mode: ■ **Keep Alive:** VPN tunnel always on line, if VPN tunnel cut off will redial. Default redial period time is 60 seconds. ■ **Manual:** When you connect Internet by VPN tunnel, then AP Router will dial to VPN server.

3G / 3.5G USB Modem Card



USB 3G modem	AP Router support 4 USB modem card. When USB modem connect to AP Router then automatic dial to Internet.3G must be operated in **Gateway** mode. ■ **NU MU-Q101** ■ **HUAWEI E169** ■ **BandLuxe C270** ■ **OPTION ICON 225**

5.3 LAN Setting

AP Router can let you configuration LAN Network for your Local Network environment, but you must choose DHCP server is enable on AP Router

LAN Setup

Hostname	AP Local host name
IP Address	IP address for the Wireless Router, as seen from the local LAN. Use the default value unless the address is already in use or your LAN is using a different IP address range. In the latter case, enter an unused IP Address from within the range used by your LAN.
Subnet Mask	The default value 255.255.255.0 is standard for small (class "C") networks. For other networks, use the Subnet Mask for the LAN segment to which the Wireless Router is attached (the same value as the PCs on that LAN segment).
DHCP Server	■ If Enabled, the Wireless Router will allocate IP Addresses to PCs (DHCP clients) on your LAN when they start up. The default (and recommended) value is Enabled. ■ If you are already using a DHCP Server, this setting must be Disabled, and the existing DHCP server must be re-configured to treat the Wireless Router as the default Gateway. See the following section for further details. ■ The **Start IP Address**, **End IP Address** and **Lease Time** fields set the values used by the DHCP server when allocating IP Addresses to DHCP clients. This range also determines the number of DHCP clients supported.
LAN2	Secondary LAN let you configure secondary local Network.
LAN2 IP Address	Configure secondary LAN2 IP address.
LAN2 Subnet Mask	Configure secondary LAN2 subnet mask.
MAC Address	Local LAN MAC address.
DHCP Type	AP Router support DHCP server on LAN. The item can choose DHCP server is enable or disable.
Start IP Address	DHCP server assign automatically IP start address
End IP Address	DHCP server assign automatically IP end address
Subnet Mask	The default value 255.255.255.0 is standard for small (class "C") networks.
Primary DNS Server	The IP address of the Domain Name Server which is currently used.
Secondary DNS Server	The IP address of the Domain Name Server which is currently used.
Default Gateway	The IP address is AP Router IP address.
Life Time (s)	DHCP server assigns IP life time. Timing is second.

Statically Assigned	As you want set up a never change fixed IP in DHCP server.
802.1d Spanning Tree	802.1d spanning tree is a link layer network protocol that ensures a loop-free topology for any bridged LAN.
LLTD	Link Layer Topology Discovery (LLTD) is a proprietary Link Layer protocol for network topology discovery and quality of service diagnostics. Microsoft developed it as part of the Windows Rally set of technologies.
IGMP Proxy	IGMP Proxy can forward IGMP packet to upstream network.
UPNP	UPnP are to allow devices to connect seamlessly and to simplify the implementation of networks.
Router Advertisement	Router will send broadcast messages or reply broadcast messages to each other router.
DNS Proxy	DNS proxy that can take DNS queries from the local network and forward them to an Internet Domain Name Server.

5.4 Wireless Setting

Please follow the steps to configuration normal wireless access point

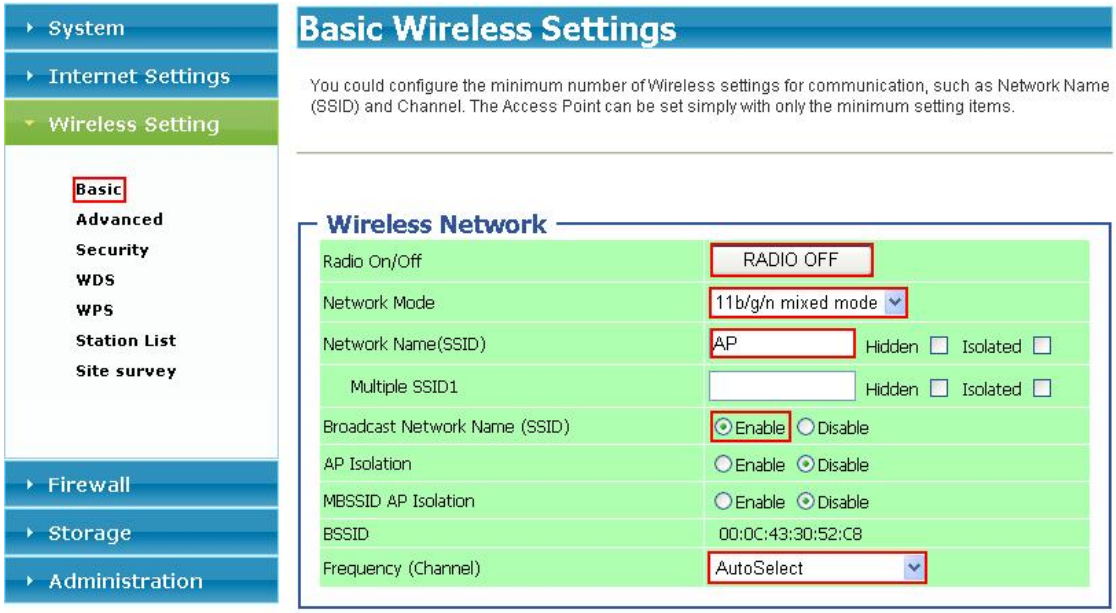
A. Select [Basic] item, click Radio On/Off button let it show [RADIO OFF].

B. Select Network Mode for your wireless environment such us [11b/g/n mixed mode].

C. Setting your Network Name (SSID) such us [JJ3052].

D. Setting Broadcast Network Name (SSID) in [Enable].

E. Select Frequency (Channel) propose set up in [Auto Select].



If you choose Wireless Network Mode use 802.11n function then follow the steps otherwise click [Apply] directly.

F. Operating Mode selects [Mixed Mode].

G. Channel Bandwidth selects [20/40].

H. Guard Interval selects [Auto].

I. MCS selects [Auto], click [Apply].

Wireless Network

Radio On/Off	Turn ON or Turn Off wireless Radio signal.
Network Mode	■ **11b/g/n mixed mode:** 802.11.g, 802.11b and 802.11n Wireless stations can use. ■ the Wireless Broadband Router. ■ **11b/g mixed mode:** 802.11.g and 802.11b Wireless stations can use the Wireless Broadband Router. ■ **11b only:** Only 802.11b connections are available. 802.11g Wireless Stations will only be able to use the Wireless Router if they are fully backward-compatible with the 802.11b standard. ■ **11g only:** Only 802.11g Wireless stations can use the Wireless Router. ■ **11n only (2.4G):** Only 802.11n Wireless stations can use the Wireless Router.
Network Name(SSID)	Display the SSID of this AP Router. The SSID is the unique name of AP Router and shared among its service area, so all devices attempts to join the same wireless network can identify it.
Multiple SSID	With Multiple SSIDs, you can have 2 SSIDs on one AP. For example, a Guest SSID without encryption for visitors to have Internet access only, and a Admin SSID with encryption for private use to secure your company resources. Select the desired SSID from the list to configure.

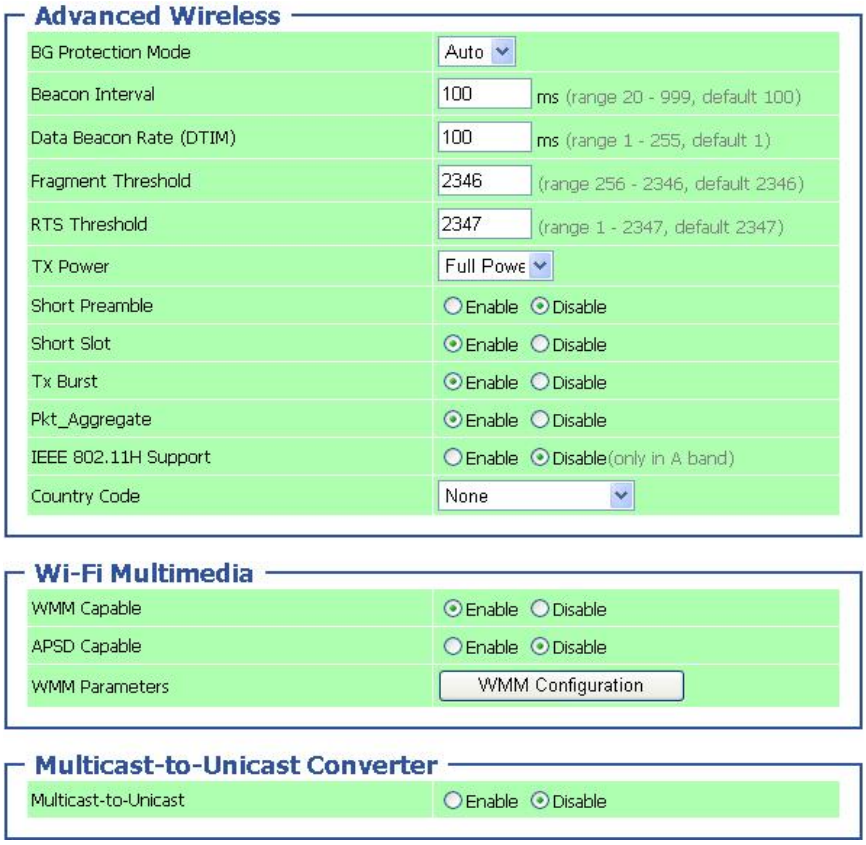
Broadcast Network Name (SSID)	If enabled, the AP Router will broadcast its SSID. This allows PCs and other wireless stations to detect this Access Point and use the correct SSID. If disabled, PC users will have to manually enter the SSID and other details of the wireless interface before they can connect to this Access Point.
AP Isolation	If Enabled, devices that have the same SSID will not be able to see each other.
MBSSID AP Isolation	If Enabled, devices that have the different SSIDs will not be able to communicate with each other.
Frequency (Channel)	■ If you experience interference (shown by lost connections and/or slow data transfers) you may need to experiment with different channels to see which is the best. ■ If using multiple Access Points, adjacent Access Points should use different Channels to reduce interference.

HT Physical Mode

Operating Mode	802.11n wireless connection signal mode.
Channel Bandwidth	Select the desired bandwidth from the list.
Guard Interval	Wireless packet head length.
MCS	802.11n wireless data rate level.
Reverse Direction Grant(RDG)	802.11n-draft2.00 in the RDG/More PPDU field of the HT Control field in the MAC frame.
Extension Channel	802.11n is used for formatting 802.11g extension signal.
Aggregation MSDU (A-MSDU)	802.11n can send multiple frames per single access to the medium by combining frames together into one larger frame. There are two forms of frame aggregation: Aggregated Mac Service Data Unit (A-MSDU) and Aggregated Mac Protocol Data Unit (A-MPDU).
Auto block ACK	Wireless in the course conveyed, don't convey ACK packet.
Decline BA Request	Refuse BA to ask in order to transmit resources sparingly.

5.5 Advanced Setting

Use the Advanced Setup page to make detailed settings for the Wireless. Advanced Setup includes items that are not available from the Basic Setup page, such as Beacon Interval, Control Tx Rates and Basic Data Rates.



Advanced wireless

BG Protection Mode	Default: Auto. You can select the other options including On and Off. The B/G protection technology is CTS-To-Self. It will try to reserve the throughput for 11g clients from 11b clients connecting to the device as AP mode.
Beacon Interval	Beacons are the packets sending by Access point to synchronize the wireless network. The beacon interval is the time interval between beacons sending by this unit in AP or AP+WDS mode. The default and recommended beacon interval is 100 milliseconds.
Data Beacon Rate (DTIM)	This is the Delivery Traffic Indication Map. It is used to alert the clients that multicast and broadcast packets buffered at the AP will be transmitted immediately after the transmission of this beacon frame. You can change the value from 1 to 255. The AP will check the buffered data according to this value. For example, selecting “1” means to check the buffered data at every beacon.

Fragment Threshold	The fragmentation threshold determines the size at which packets are fragmented (sent as several pieces instead of as one block). Use a low setting in areas where communication is poor or where there is a great deal of radio interference. This function will help you to improve the network performance.
RTS Threshold	The RTS threshold determines the packet size at which the radio issues a request to send (RTS) before sending the packet. A low RTS Threshold setting can be useful in areas where many client devices are associating with the device, or in areas where the clients are far apart and can detect only the device and not each other. You can enter a setting ranging from 0 to 2347 bytes.
TX Power	TX Power level: **Full Power:** TX power is 100% **Normal Power:** TX power is 50% **Quarter Power:** TX power is 25% **Minimum Power:** TX power is 10%
Short Preamble	Default: Disable. It is a performance parameter for 802.11 b/g mode and not supported by some of very early stage of 802.11b station cards. If there is no such kind of stations associated to this AP, you can enable this function.
Short Slot	It is used to shorten the communication time between this AP and station.
Tx Burst	The device will try to send a serial of packages with single ACK reply from the clients. Enable this function to apply it.
Pkt_Aggregate	The parameter can be used to increase the delivered bandwidth in community networks including fixed and mobile stations.
IEEE 802.11H Support	IEEE 802.11H to the amendment added to the IEEE 802.11 standard for Spectrum and Transmit Power Management Extensions.
Country Code	AP Router support different country frequency Regulation.

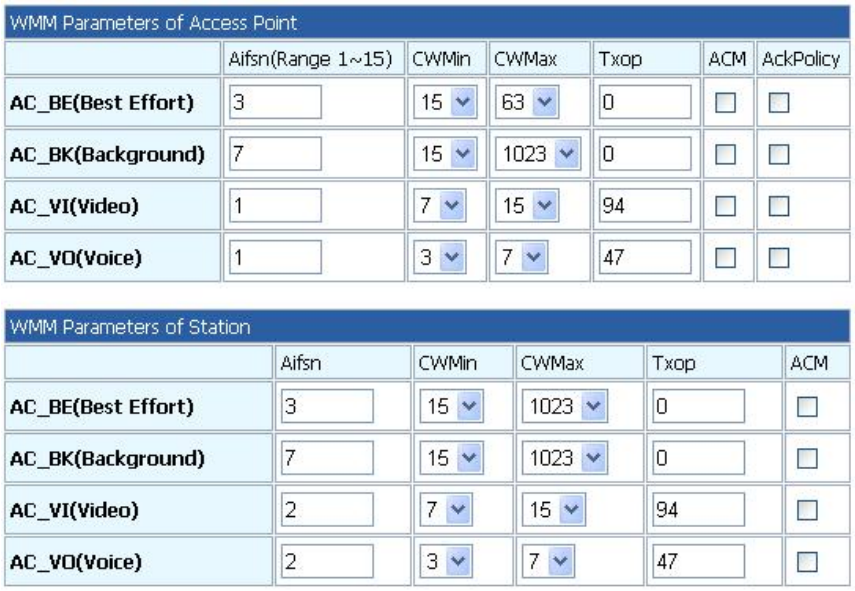
Wi-Fi Multimedia

WMM Capable	Quality of Service is a set of features for Wi-Fi networks that improve the user experience for audio, video, and voice applications by prioritizing data traffic.
APSD Capable	APSD is a more efficient power management method than legacy 802.11 Power Save Polling. Most newer 802.11 stations already support a power management mechanism similar to APSD. APSD is very useful

	for a VoIP phone, as data rates are roughly the same in both directions.
WMM Parameters	WMM configuration form.

Multicast-to-Unicast Converter

Multicast-to-Unicast	Multicast streams from the network backbone, converts them to Unicast format, and routes them to the set-top-boxes of end-users over the last mile infrastructure (WiFi). When an end-user wants to watch a particular IPTV channel, he sends a request to his set-top-box via a remote controller. The set-top-box in turn sends content request to IPTV Switch via the Internet Group Management Protocol (IGMP). Upon receiving such request, IPTV Switch captures the requested IPTV Multicast stream, converts it into Unicast format and routes it to the set-top-box of the end-user.



5.6 WMM configuration

WMM Parameters of Access Point

AC_BE(Best Effort)	High throughput. Bulk data that requires maximum throughput and is not time-sensitive is sent to this queue (FTP data, for example).
AC_BK(Background)	Medium throughput and delay. Most traditional IP data is sent to this queue
AC_VI(Video)	Medium throughput and delay. Most traditional IP data is sent to this queue

AC_VO(Video)	Time-sensitive data like VoIP and streaming media are automatically sent to this queue
Aifsn	The Arbitration Inter-Frame Spacing Number specifies a wait time (in milliseconds) for data frames
CWMin	Valid values for the "cwmin" are 1, 3, 7, 15, 31, 63, 127, 255, 511, or 1024. The value for "cwmin" must be lower than the value for "cwmax".
CWMax	Valid values for the "cwmax" are 1, 3, 7, 15, 31, 63, 127, 255, 511, or 1024. The value for "cwmax" must be higher than the value for "cwmin".
Txop	an interval of time when a WME Client Station has the right to initiate transmissions onto the wireless medium (WM). This value specifies (in milliseconds) the Transmission Opportunity (TXOP) for Client Station; that is, the interval of time when the WMM AP has the right to initiate transmissions on the wireless network.
ACM	Only takes effect on AC_VI and AC_VO. When you set it disable, it means that the ACM is controlled by the connecting AP. If you set it enable, it means that the Client is in charge.
AckPolicy	When the WMM packets be delivered, it will also send a request back. If you set it disable, it means that the system do not want to answer the request. If it enable, it means that the system will reply the request. If the system does not reply the request, WMM might have better efficiency.

WMM Parameters of Station

AC_BE(Best Effort)	High throughput. Bulk data that requires maximum throughput and is not time-sensitive is sent to this queue (FTP data, for example).
AC_BK(Background)	Medium throughput and delay. Most traditional IP data is sent to this queue
AC_VI(Video)	Minimum delay. Time-sensitive video data is automatically sent to this queue
AC_VO(Video)	Time-sensitive data like VoIP and streaming media are automatically sent to this queue

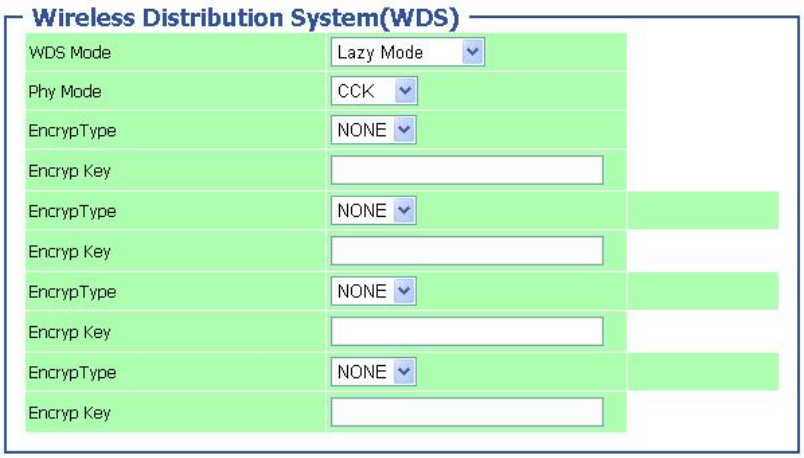
5.7 WDS configuration

How to setting Wireless Distribution Systems (WDS).Each WDS APs need setting as same channel, encryption type.(not support mixed mode, like WPAPSKWPA2PSK).WDS Security support up to pre-shared key, this is inter AP's security and 802.1x support.

WDS

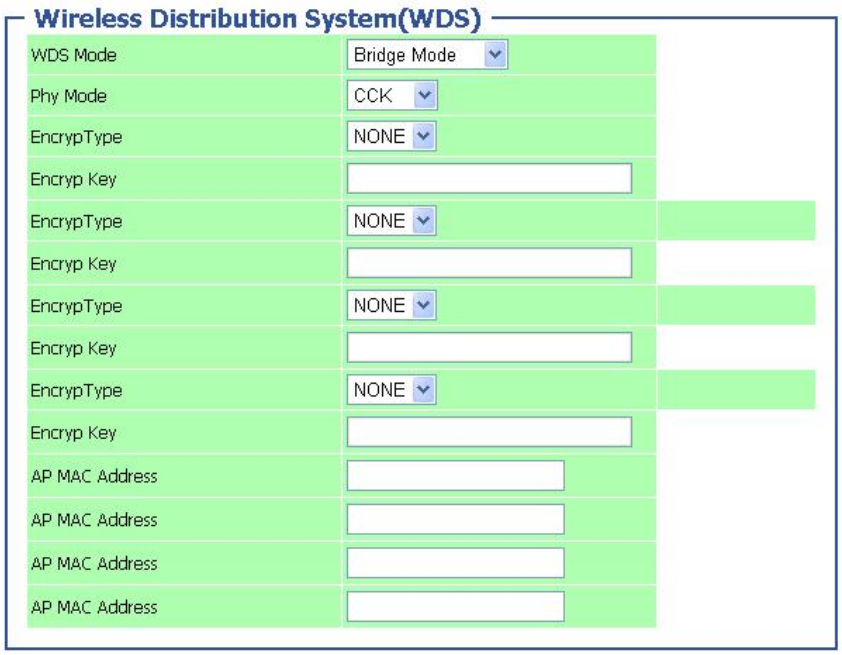
Disable	Disable WDS function.
Lazy Mode	Lazy Mode can auto learning WDS peers. But have to note that can't set each AP to Lazy mode, otherwise no addr4 will be carried by each AP.
Bridge Mode	Bridge Mode can't auto learning. It need WDS peers MAC address, and can hidden wireless signal.
Repeater	Bridge Mode can't auto learning. It need WDS peers MAC address. It have WDS and AP function.

Lazy Mode



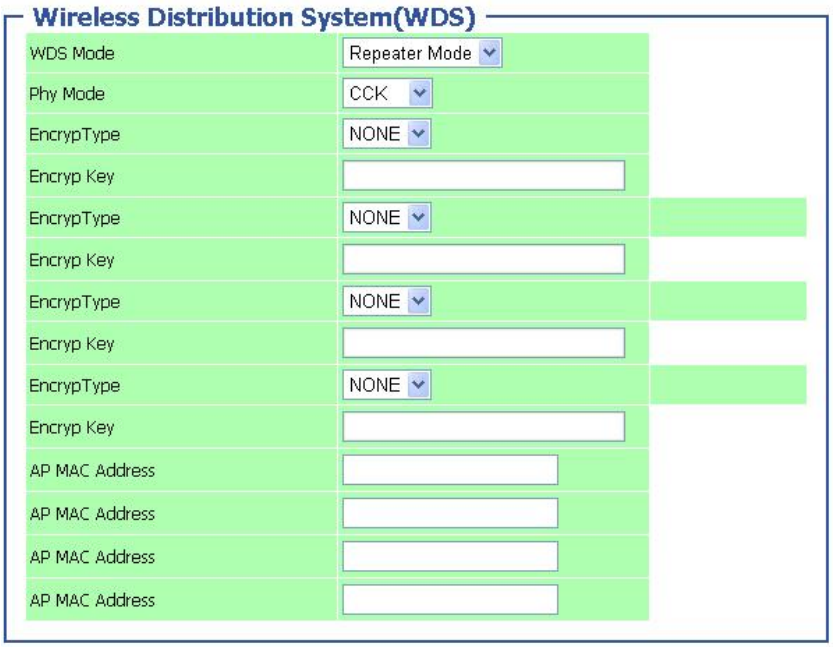
WDS Mode	Lazy Mode can auto learning WDS peers. But have to note that can't set each AP to Lazy mode, otherwise no addr4 will be carried by each AP.
Phy Mode	Wireless Data Modulation type.
Encryp Type	Wireless encrypt type.
Encryp Key	Wireless encrypt key.

Bridge Mode



WDS Mode	Bridge Mode can't auto learning. It need WDS peers MAC address, and can hidden wireless signal.
Phy Mode	Wireless Data Modulation type.
Encryp Type	Wireless encrypt type.
Encryp Key	Wireless encrypt key.
AP MAC Address	WDS peer's Wireless MAC address.

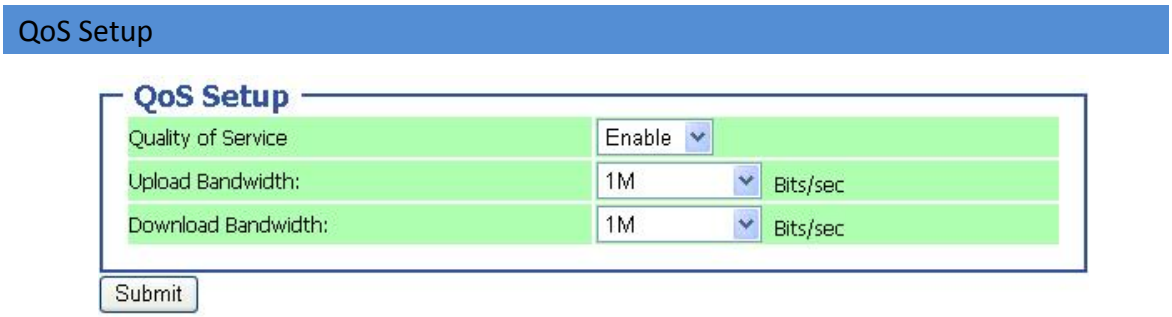
Repeater Mode



WDS Mode	Bridge Mode can't auto learning. It need WDS peers MAC address. It have WDS and AP function.
Phy Mode	Wireless Data Modulation type.
Encryp Type	Wireless encrypt type.
Encryp Key	Wireless encrypt key.
AP MAC Address	WDS peer's Wireless MAC address.

5.8 QoS

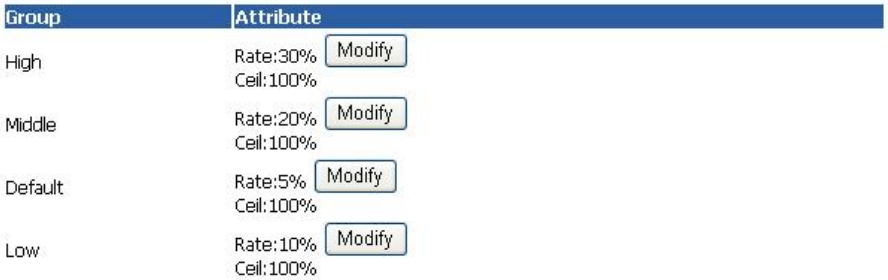
The chapter let you may setup rules to provide Quality of Service guarantees for specific applications. QoS function only support Gateway mode Upload control.



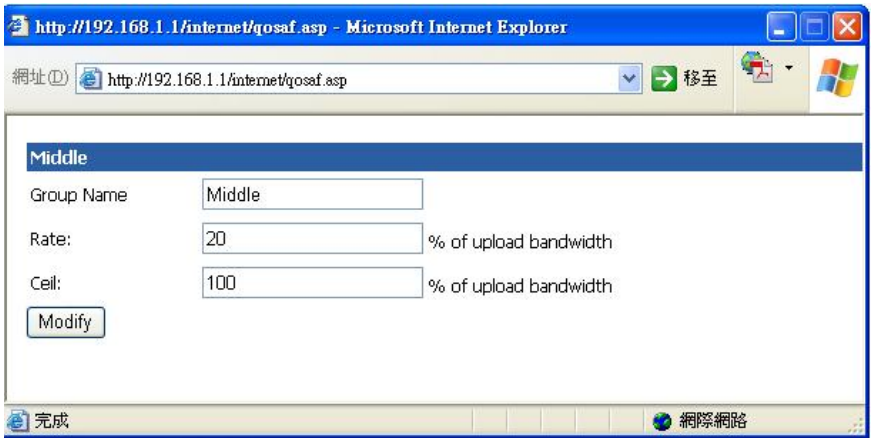
Quality of Service	Default setting is disable, when you want enable QoS function must be select Enable.
Upload Bandwidth	Select Upload Bandwidth date rate.
Download Bandwidth	Select Download Bandwidth date rate.
Submit	Launch after you decide that select for Upload bandwidth & Download Bandwidth. Let QoS function enable.

You will see the option below after QoS function enable.

After enabling QoS, 4 groups would be shown as below. Now all packets through this gateway would be classified into these 4 groups according to user's QoS rules. There are 3 attributes in every group as following picture:



Group Modify



Name	User can define the group name by his/her own.
Rate	Specifies the guaranteed minimum bandwidth that a group can use.
Ceil	Specifies the maximum bandwidth that a group can use.

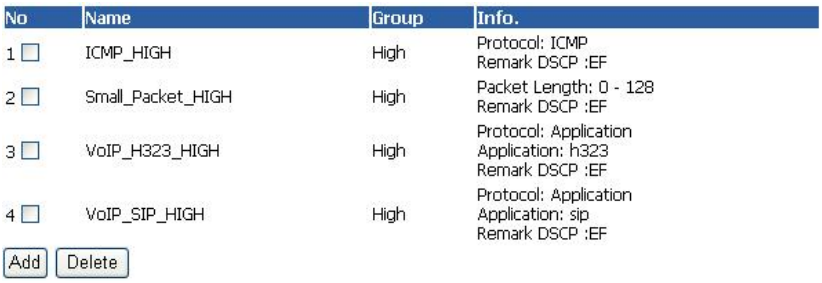
User can press [Modify] to change the 3 attributes in every group.

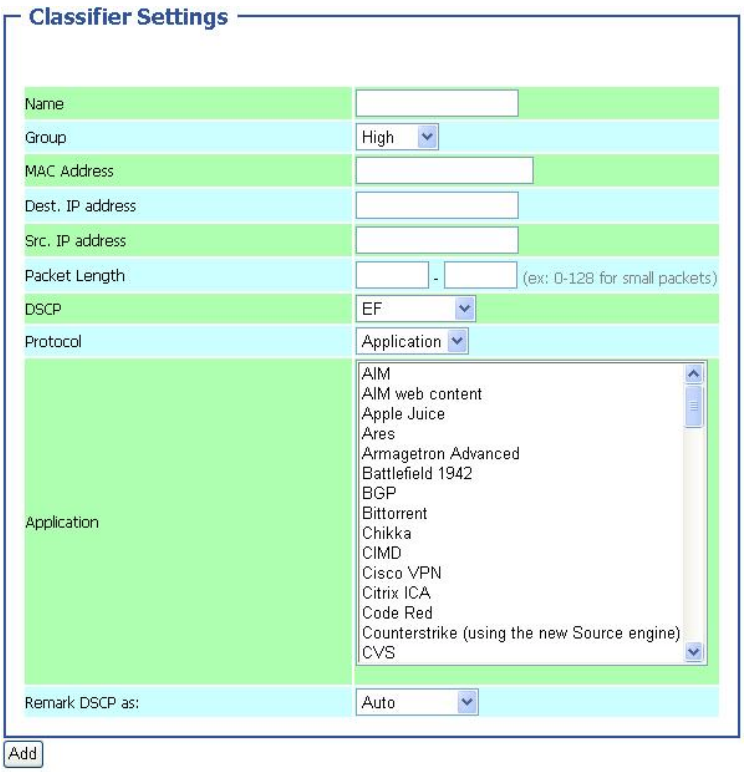
In these groups, the first group has the highest priority, the next one has the second priority, the third group is default group, and the last has the lowest priority.“Highest priority” means the rest bandwidth will serve the group first, but rules about guaranteed rate and ceil in every group are still met. For example, people often hope VoIP traffic to be classified to the highest priority group for short latency, and P2P traffic to be classified to the lowest priority to prevent from greed.

Now we can create QoS rule to do classification, and remarking.

QoS Rule

Click [Add] display classifier Settings windows as following picture:


No
Name
Group
Info.
1 ICMP_HIGH High Protocol: ICMP Remark DSCP :EF
2 Small_Packet_HIGH High Packet Length: 0 - 128 Remark DSCP :EF
3 VoIP_H323_HIGH High Protocol: Application Application: h323 Remark DSCP :EF
4 VoIP_SIP_HIGH High Protocol: Application Application: sip Remark DSCP :EF
Add
Delete



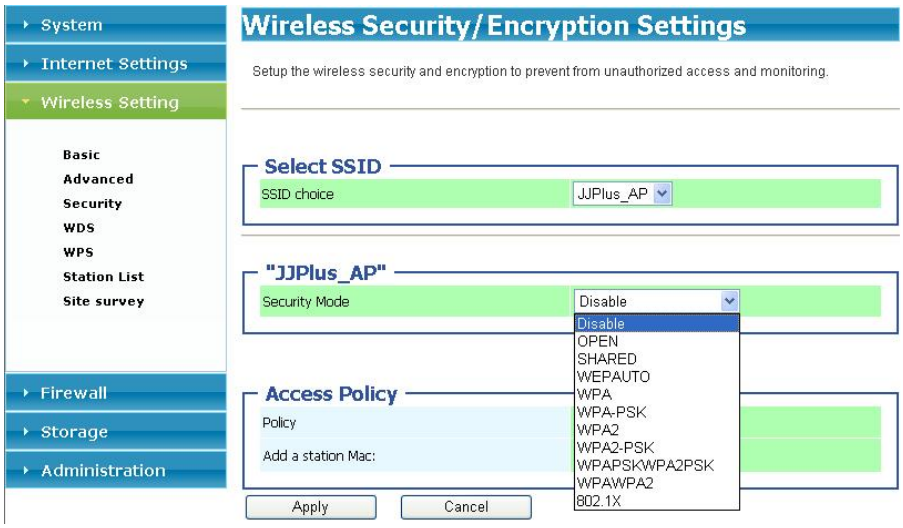
Name	Specifies this rules name.
Group	Specifies which group this rule is belongs to.
MAC Address	Source MAC Address.
Dest. IP address	Destination IP address with netmask.
Src. IP address	Source IP address with netmask.
Packet Length	QoS filter packet length. small packets: 0 max packets: 2048.
DSCP	DSCP value would be remarked into the packet which matches the rule.
Protocol	QoS rules filter Protocol type: TCP/UDP/ICMP/Application.
Remark DSCP as:	This argument specifies what DSCP value would be remarked into the packet which matches the rule.

Chapter 6 Wireless Security

Chapter 6 is about how to set up wireless encryption function and wireless access control function. AP Router support wireless encryption have WEP, WAP, WPA2, 802.1x. Wireless access control function is MAC access control.

6.1 Encryption Setting

AP Router provide Wireless encryption function. It can support single SSID and multiple SSID.AP Router is accessed by selects the [Security] item on the Wireless encryption. There are 11Options for Wireless security.

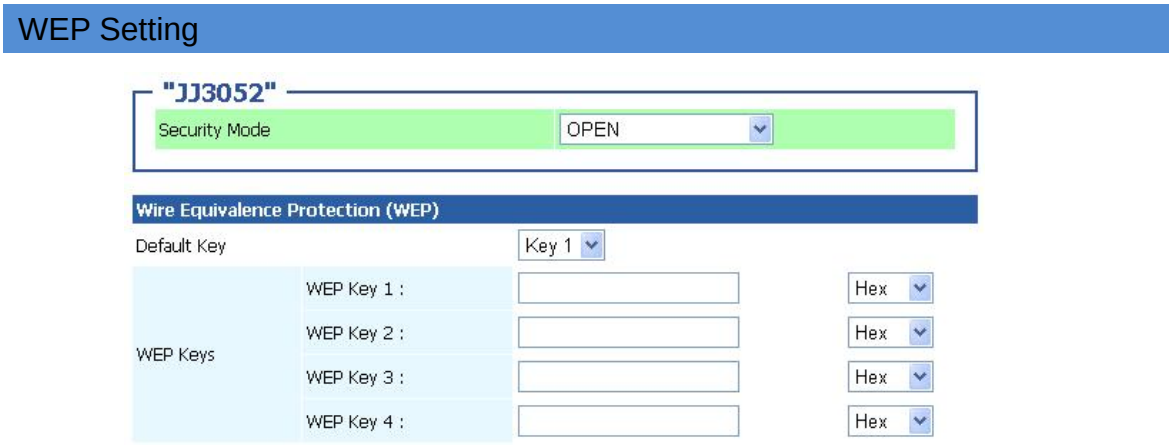


Security Mode

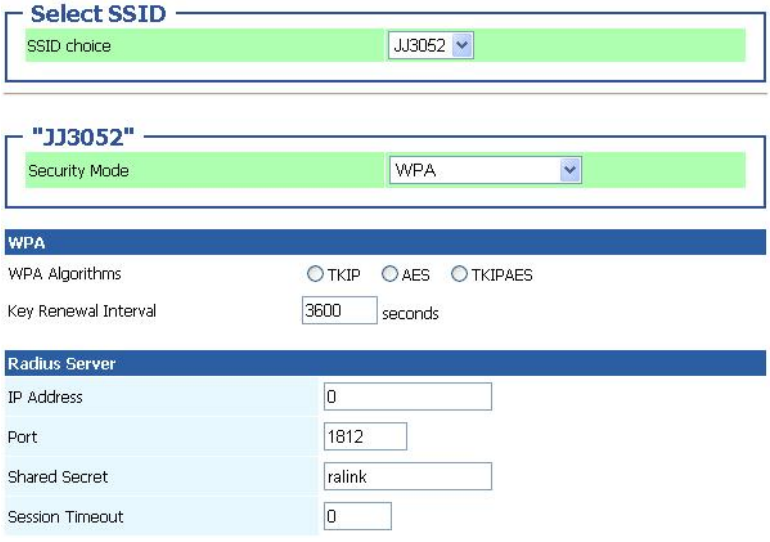
Disable	No data encryption is used.
OPEN	Data is encrypted using the WEP-OPEN standard.
SHARED	Data is encrypted using the WEP-SHARED standard.
WEPAUTO	Data is encrypted using the WEP-OPEN/SHARED automatically choose.
WPA	Data is encrypted using the WPA-RADIUS standard.
WPA-PSK	Data is encrypted using the WPA-PSK standard.
WPA2	Data is encrypted using the WPA2-RADIUS standard.
WPA2-PSK	Data is encrypted using the WPA2-PSK standard and support Pre-Authentication.
WPA-PSKWPA2-PSK	Data is encrypted using the WPA-PSKWPA2-PSK automatically choose.

WPA/WPA2	Data is encrypted using the WPA-RADIUS/WPA2-RADIUS automatically choose.
802.1x	Wireless client authentication using 802.1x.Wireless connection data encrypted using WEP standard.

6.2 WEP-OPEN/SHARED/AUTO



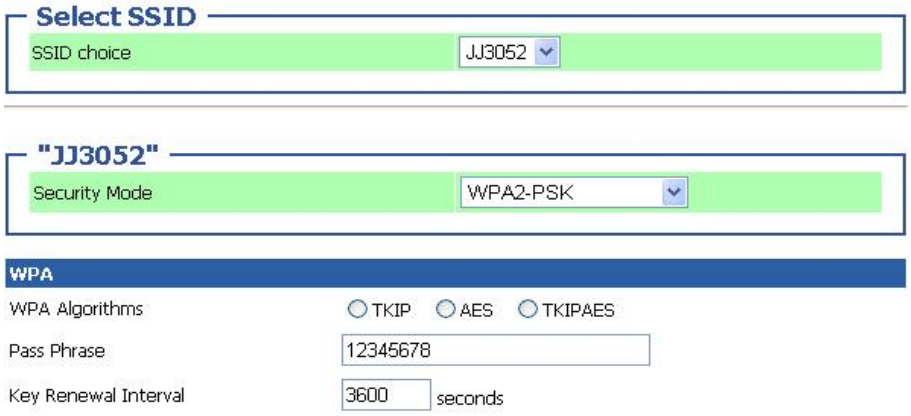
Security Mode	WEP support OPEN/SHARD/WEPAUTO three modes.
Default Key	WEP key that is using at present.
WEP Keys	WEP Key can preserve four groups of 64/128bit key and use Hex and ASCII ■ **Hex**:10/26 chars (0~9 and A~F). ■ **ASCII:**5/13 Number and English characters.



6.3 WPA/WPAWPA2

WPA/WPAWPA2 Setting

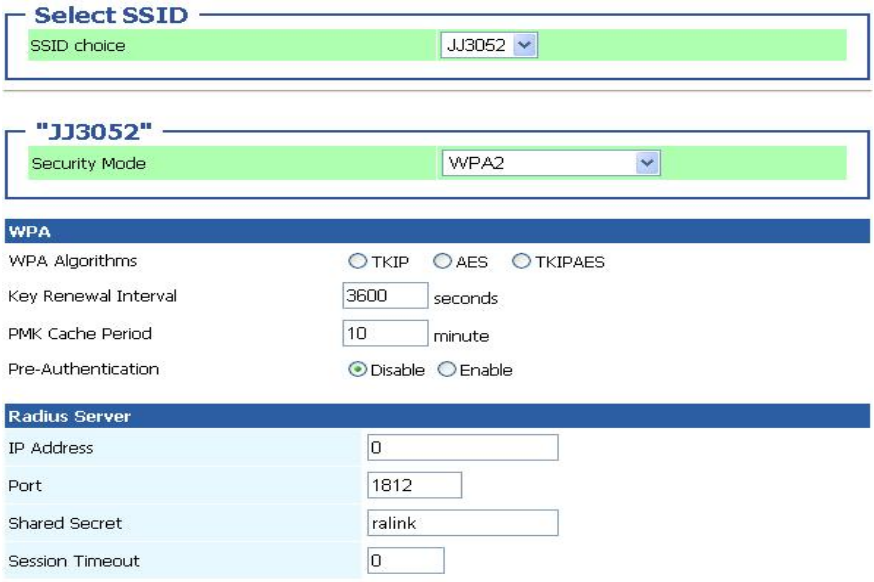
WPA Algorithms	Choose WPA encryption algorithms mode.
Key Renewal Interval	Wireless encryption confirm interval time.
IP Address	RADIUS server IP address.
Port	RADIUS server Authentication port the port number is follow your RADIUS configuration. AP Router default port number config is 1812.
Shared Secret	RADIUS Authentication key. The key must be from 8 to 63 characters in length.
Session Timeout	RADIUS Authentication session timeout. Default is 0.



6.4 WPA-PSK/WPA2-PSK/WPA-PSKWPA2-PSK

WPA-PSK/WPA2-PSK/WPA-PSKWPA2-PSK Setting

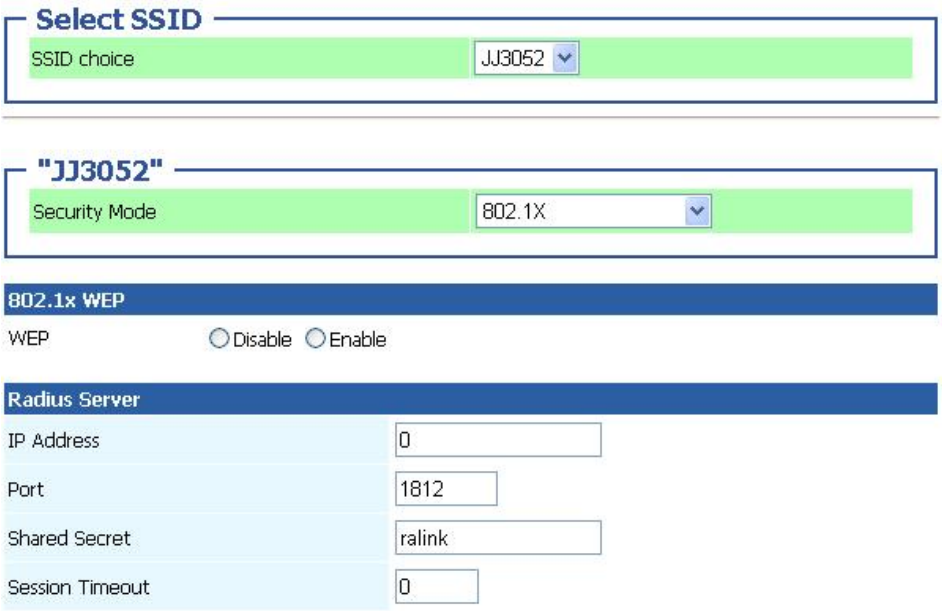
WPA Algorithms	Choose WPA encryption algorithms type.
Pass Phrase	WPA-PSK&WPA2-PSK authentication encryption chars key. The PSK must be from 8 to 63 characters in length.
Key Renewal Interval	Wireless encryption confirm interval time.



6.5 WPA2

WPA2 Setting

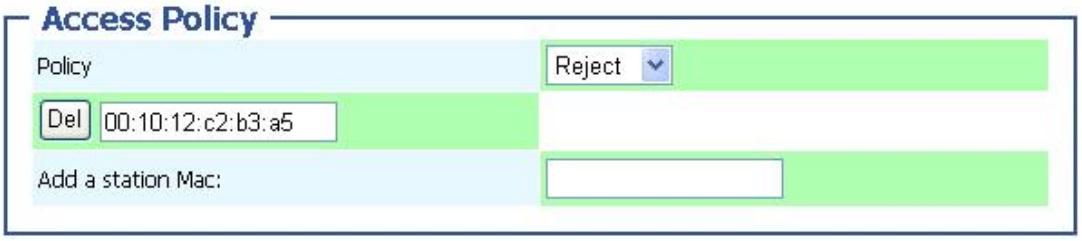
WPA Algorithms	Choose WPA encryption algorithms mode.
Key Renewal Interval	Wireless encryption confirm interval time.
PMK Cache Period	PMK cache confirm time. Default setting is 10 minute.
Pre-Authentication	The function of Pre-Authentication allows to can carry on the movements 802.1x/EAP Authentication in the same time. Default setting is Disable.
IP Address	RADIUS server IP address.
Port	RADIUS server Authentication port default port number is 1812.
Shared Secret	RADIUS Authentication key. The key must be from 8 to 63 characters in length.
Session Timeout	RADIUS Authentication session timeout. Default is 0.



6.6 802.1x

802.1x Setting

802.1x WEP	Choose Wireless data encryption is using WEP.
IP Address	RADIUS server IP address.
Port	RADIUS server Authentication port default port number is 1812.
Shared Secret	RADIUS Authentication key. The key must be from 8 to 63 characters in length.
Session Timeout	RADIUS Authentication session timeout. Default is 0.



6.7 MAC Access Control

MAC Access control can filter wireless client MAC address connect to AP.

MAC Access Control Setting

Policy	MAC access control filter policy function type: ■ **Disable:** disable MAC access control function. ■ **Allow:** Allow wireless client MAC can connect to AP. ■ **Reject:** Reject wireless client MAC connect to AP.
Del	Delete not need MAC address.
Port	RADIUS server Authentication port default port number is 1812.
Add a station Mac	Key in need filter MAC address to policy.

Chapter 7 WPS

WPS is a standard for easy and secure establishment of a wireless home network. The goal of the WPS protocol is to simplify the process of configuring security on wireless networks, so WPS must match WEP and WPA/WPA2.WPS support two operation mode PIN and PBC.

7.1 WPS-PIN setting

When wireless client connect to AP is using PIN. Then AP Router WPS mode select [PIN], key in Wireless client PIN code to [PIN] field, click [Apply].

WPS-PIN

WPS mode	■ **PIN:** AP key in wireless client own PIN code to connect. PIN key must be 8 characters length in (0~9). ■ **PBC:** Wireless client connect to AP automatically and wireless client get AP PIN code.
PIN	Key in wireless client PIN code.

7.2 WPS-PBC setting

When wireless client connect to AP is using PBC. Then AP Router WPS mode select [PBC], click [Apply].

WPS-PIN

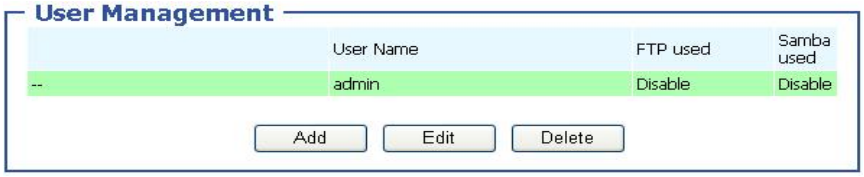
WPS mode	■ **PIN:** AP key in wireless client own PIN code to connect. PIN key must be 8 characters length in (0~9). ■ **PBC:** Wireless client connect to AP automatically and wireless client get AP PIN code.
AP PIN: Generate	Generate a new AP PIN code.
Reset OOB	Reset AP SSID.

Chapter 8 Storage

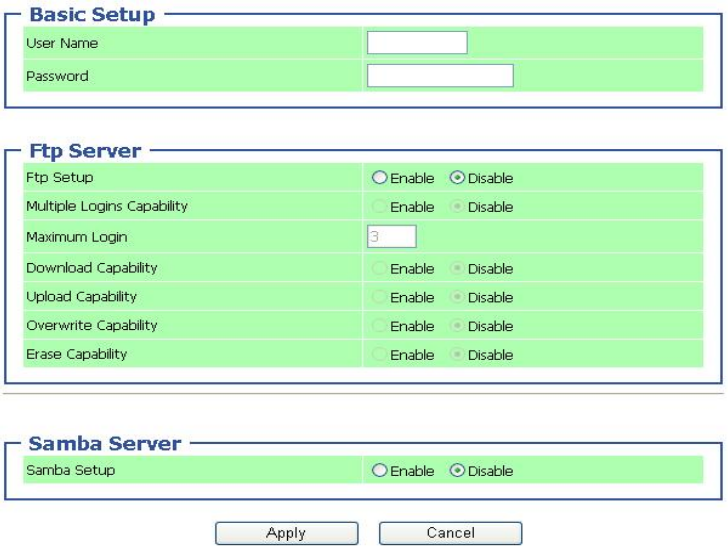
AP Router support storage function used exterior USB storage. It can access USB storage data use FTP server form Internet, or use SAMBA server form Intranet.

8.1 User admin

The item can creation and management user's account number for FTP server or SAMBA server.



Click [Add] button then will display set up page. The page can setting user's account number limits of authority.



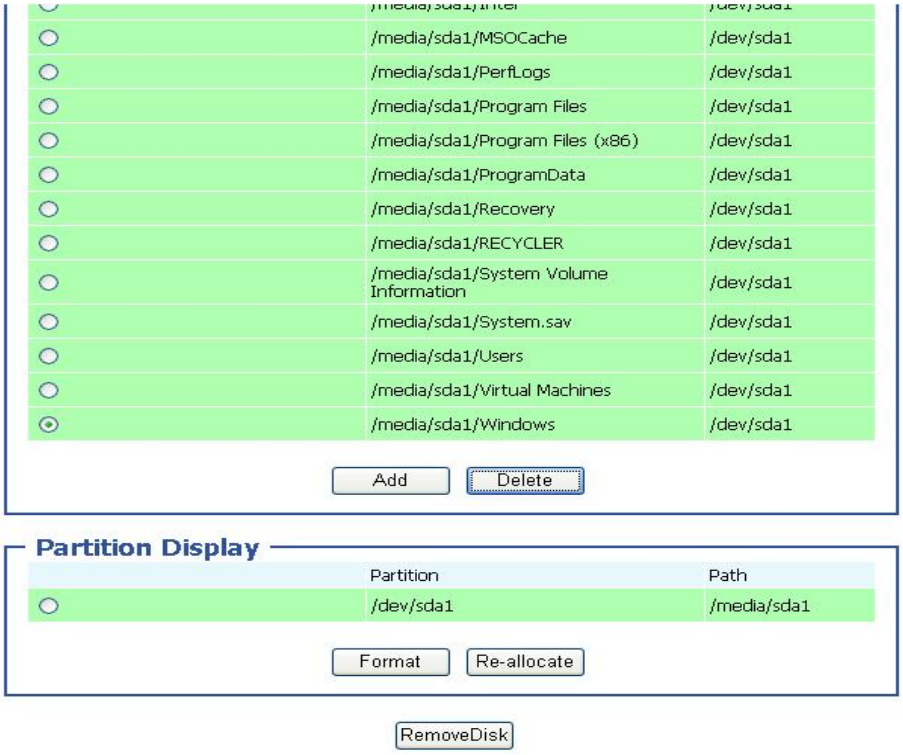
Storage User admin

User Name	User account name.
Password	User account password.
Ftp Setup	Account number can use in Ftp server.
Multiple Logins Capability	Allow the same account number to login the quantity with time.

Maximum Login	Login same account number max quantity.
Download Capability	The account number is in the download authority of FTP server.
Upload Capability	The account number is in the upload authority of FTP server.
Overwrite Capability	The account number is in the overwrite authority of FTP server.
Erase Capability	The account number is in the erase authority of FTP server.
Samba Setup	Account number can use in SAMBA server.

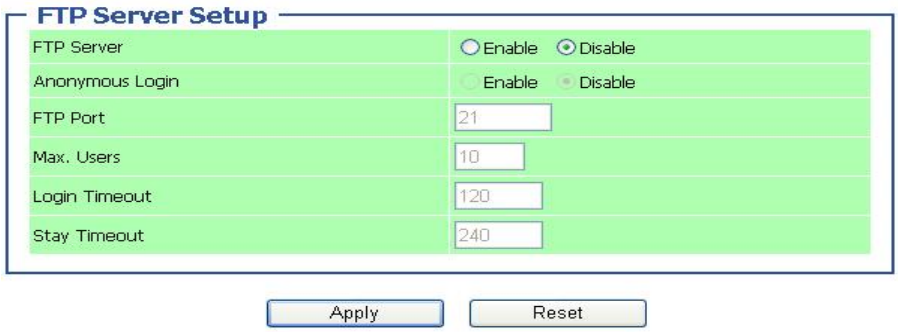
8.2 Disk Management

The item can display and management USB disk directory and files.



Disk Management

Add	Add a new directory or file on disk.
Delete	Delete a directory or file on disk.
Format	Format USB storage.
Re-allocate	Re-allocate USB storage partition.
Remove Disk	Remove USB storage for AP Router.



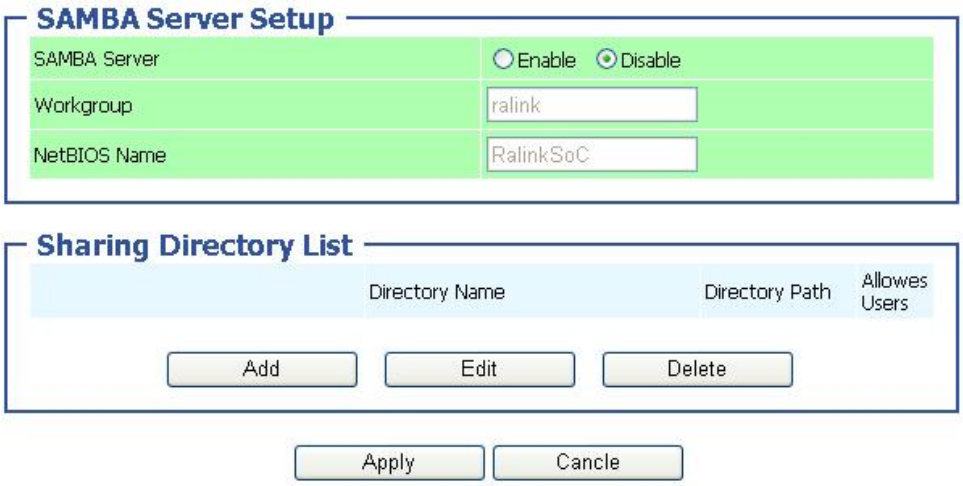
8.3 FTP Server setting

FTP Server

FTP Server	FTP server function Disable/Enable option.
Anonymous Login	FTP server allow anonymous user login.
FTP Port	FTP service port number Default is 21.
Max. Users	FTP server allow Max. login users quantity.
Login Timeout	User login fail retry timeout.
Stay Timeout	User account idle timeout.

8.4 SAMBA Server setting

Samba is standard on nearly all distributions of Linux and is commonly included as a basic system service on other Unix-based operating systems as well. Samba is released under the GNU General Public License. The name Samba comes from SMB (Server Message Block), the name of the standard protocol used by the Microsoft Windows network file system.

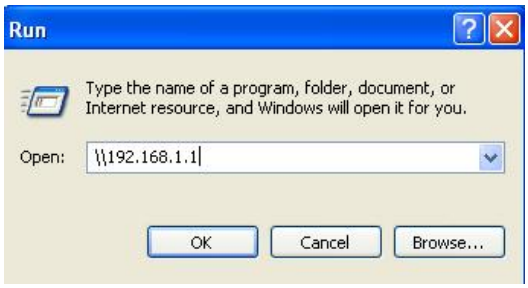


SAMBA Server

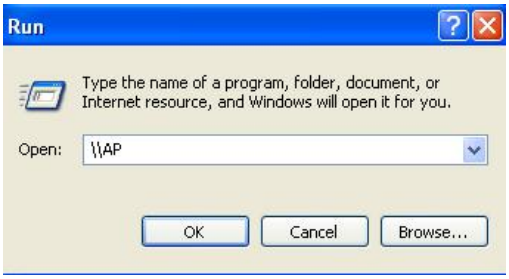
SAMBA Server	SAMBA server function Disable/Enable option.
Workgroup	Network share workgroup.
NetBIOS Name	Support WinNT/Win98 Network name.
Add	Add a new share directory in Network.
Edit	Edit Network directory limits of authority.
Stay Timeout	User account idle timeout.

Click on [Start] > [Run] > [Open] > Key in AP Router IP Address. Default is **192.168.1.1** or AP Hostname Default is **AP**. To access SAMBA Server.

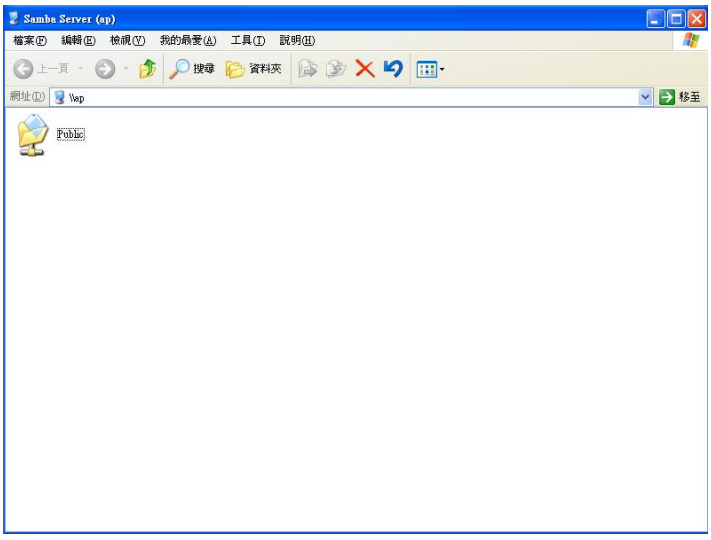
AP Router IP Address



AP Router Hostname



SAMBA Directory



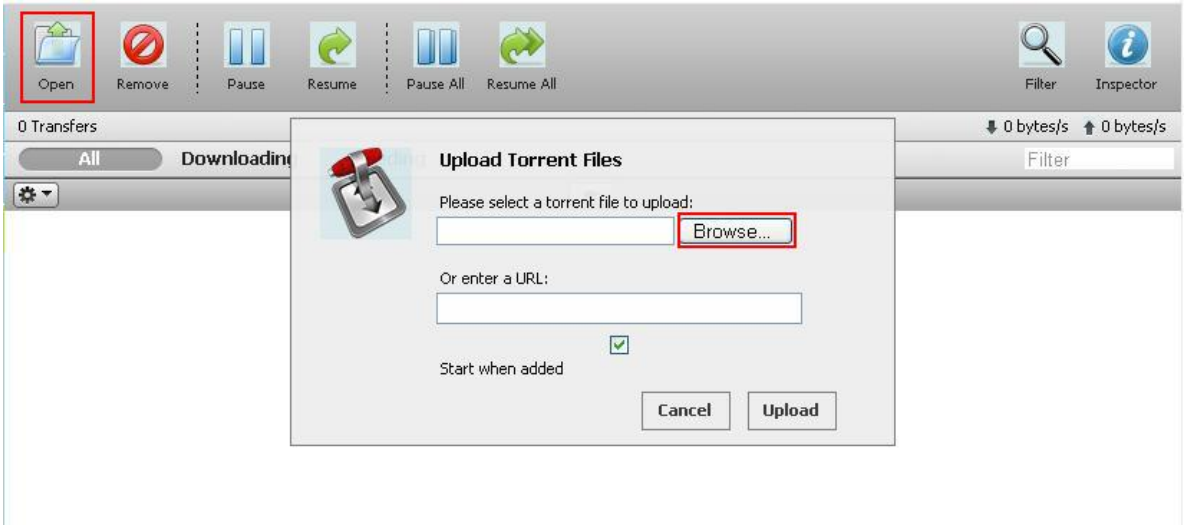
8.5 Bittorrent setting

Bittorrent is a peer-to-peer file sharing protocol used for distributing large amounts of data. The Bittorrent of JWAI203/JWAI204 can combine SAMBA function throughput Network to access and share USB storage resources. No need to remove USB storage to PC access and share Data resource.

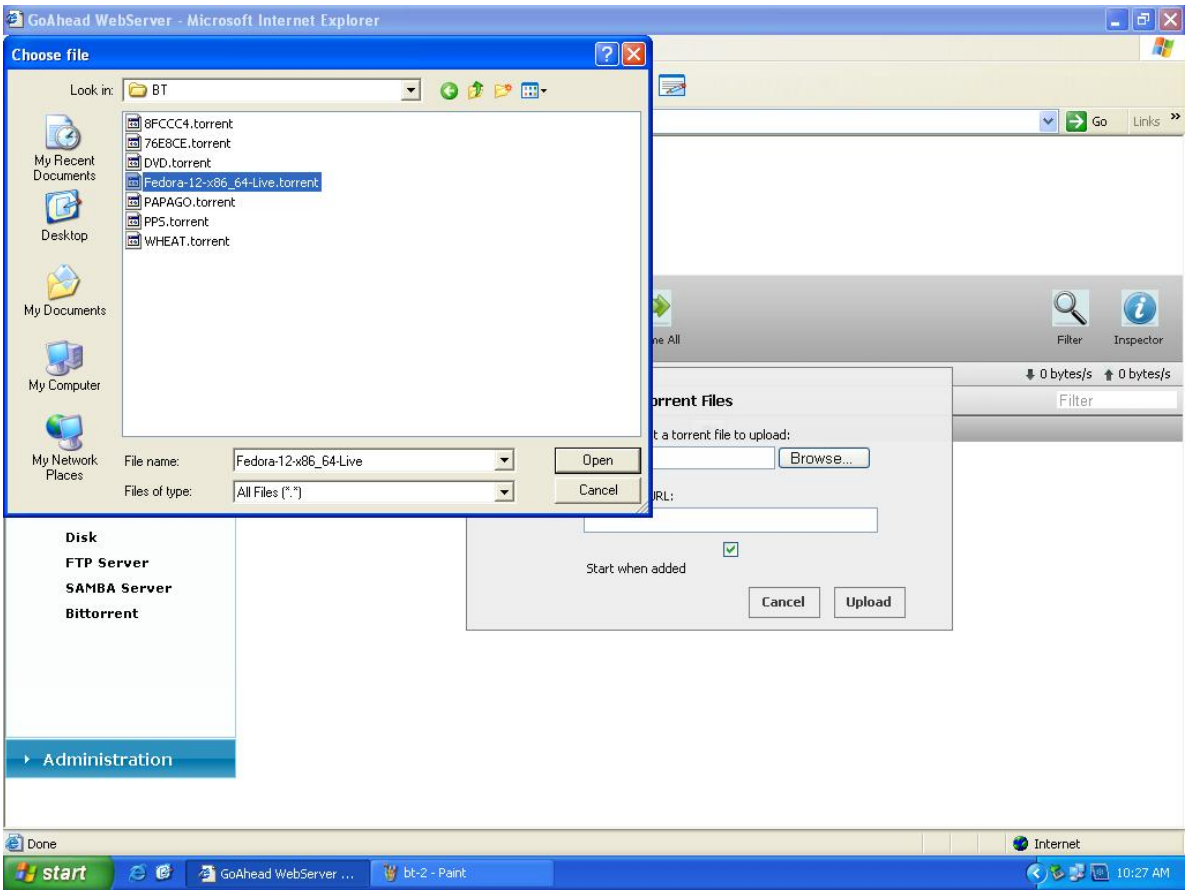
Bittorrent	
Open	Add torrent files to Bittorrent.
Remove	Remove torrent files for Bittorrent.
Pause	Pause single transfer torrent.
Resume	Resume single torrent.
Pause All	Pause all transfer torrents.
Resume All	Resume all torrents.
Filter	Filter torrents status **All:** All torrents status. **Downloading:** Downloading torrents status. **Seeding:** Upload torrents status. **Paused:** Paused torrents status.

Select [Bittorrent] item to open Bittorrent function page.

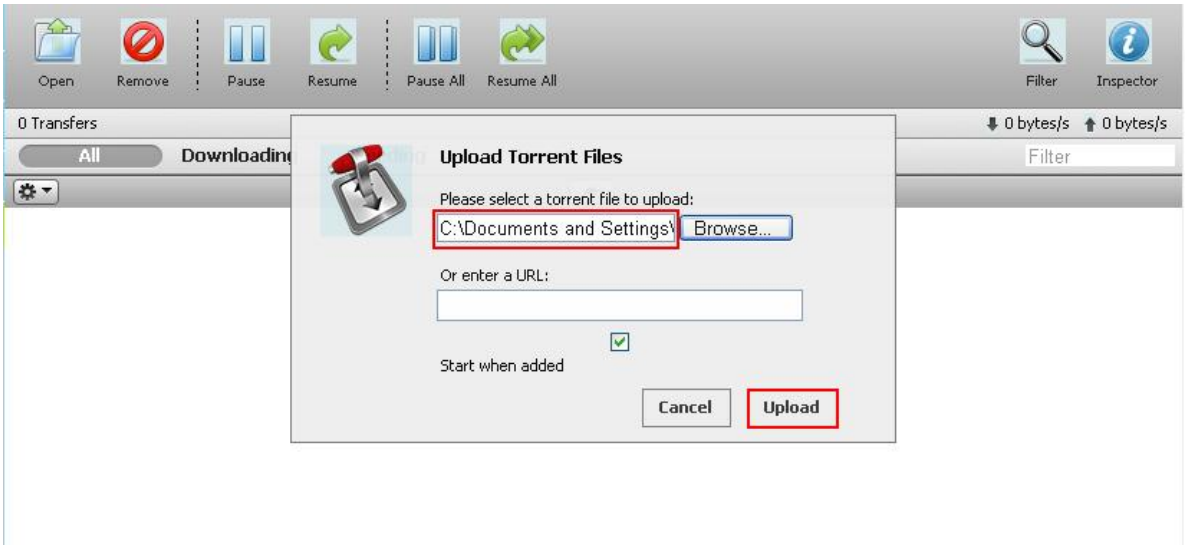
Click [Open] > [Browse]



Select torrent file



Click [Upload]

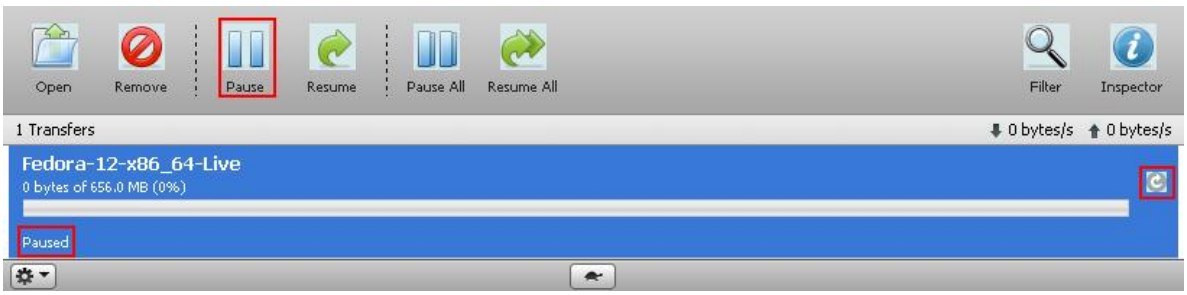


1 Transfers: Torrent number Max is 6.

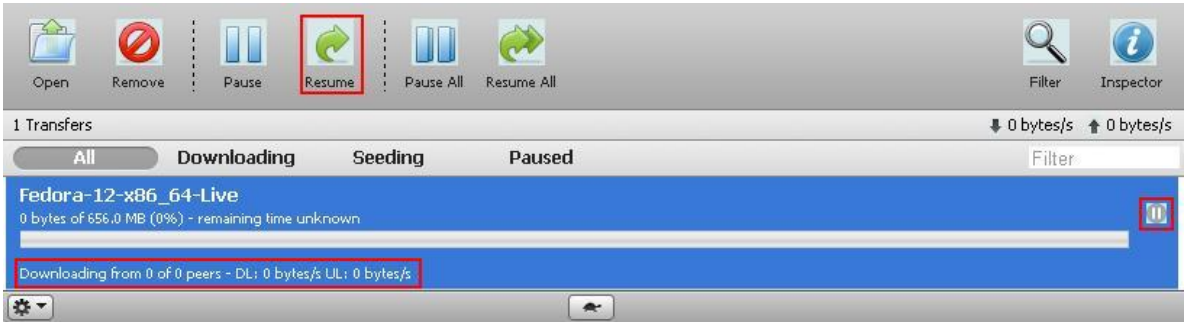
0 bytes/s : All torrents downloading speed.

0 bytes/s : All torrents uploading speed.

When click Pause. Torrent show Paused and stop transfer.

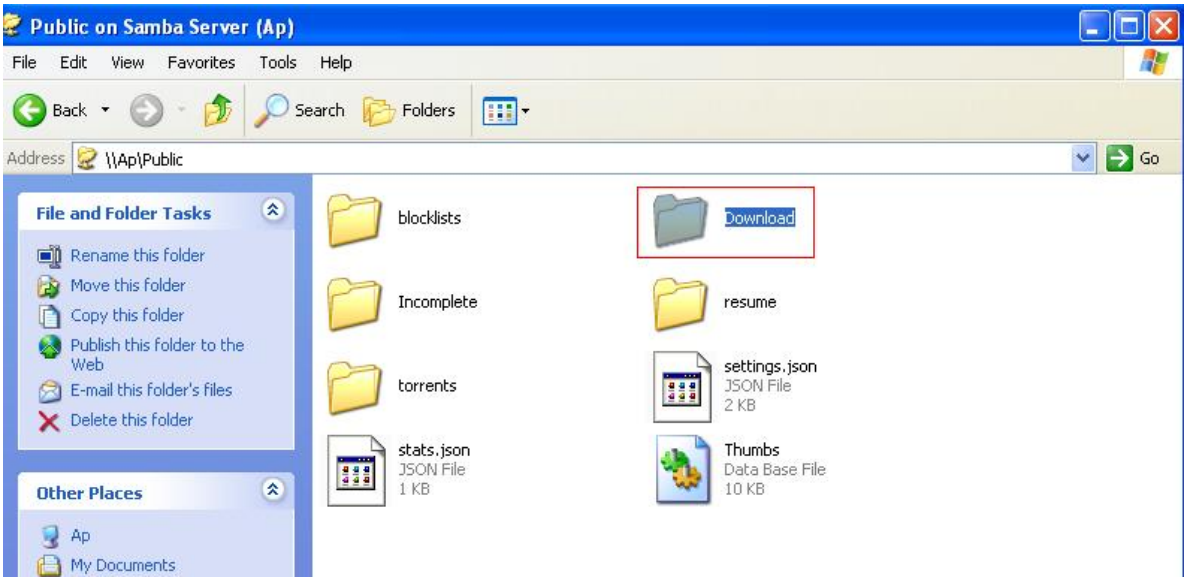


When click Resume. Torrent show Downloading peer number max is 40 and downloading speed.



Preferences: Bittorrent advanced setting option.
Total Download Rate: Setting Download Rate speed.
Total Upload Rate: Setting Upload Rate speed.
Sort Transfers By: Torrent Sort transfers.

Bittorrent combine SAMBA function throughput Network to access and share USB storage resources.

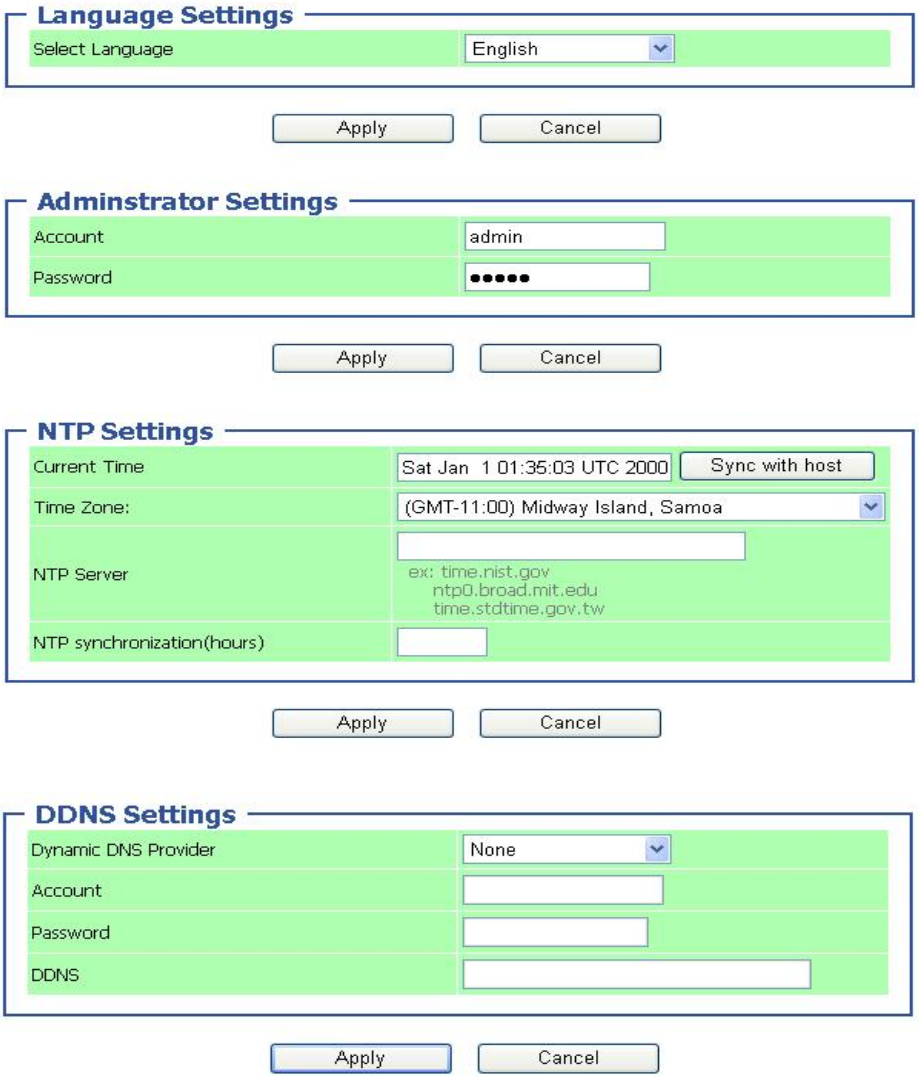


Chapter 9 System Management

AP Router let you configure and management administrator account/password, NTP setting, Language select, Firmware update, AP configure setting backup, Linux system command line support.

9.1 Management

You may configure administrator account and password, NTP settings, and Dynamic DNS settings (DDNS) here.

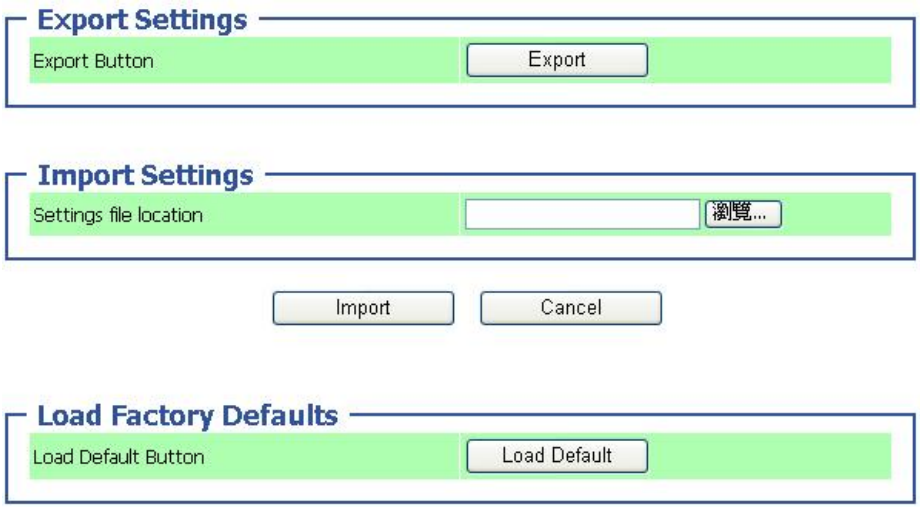


Management

Select Language	AP Router support two families of languages of Traditional Chinese and English at present.
Administrator Settings	Setting AP Router administrator account and password. Default is **admin/admin**
NTP Setting	Support NTP server setting ■ Current Time: Display present date and time. ■ Time Zone: Setting local time zone. ■ NTP Server: Setting NTP server website address. ■ NTP synchronization (hours): Setting AP Router with NTP server synchronization time interval.
DDNS Settings	Dynamic DNS is a method, protocol, or network service that provides the capability for a networked device, such as a router or computer system using the Internet Protocol Suite, to notify a domain name server to change, in real time (ad-hoc) the active DNS configuration of its configured hostnames, addresses or other information stored in DNS. ■ Dynamic DNS Provider: Select DDNS server. ■ Account: Setting DDNS login account. ■ Password: Setting DDNS login password. ■ DDNS: DDNS name.

9.2 Settings backup & restore

You might save system settings by exporting them to a configuration file, restore them by importing the file, or reset them to factory default.

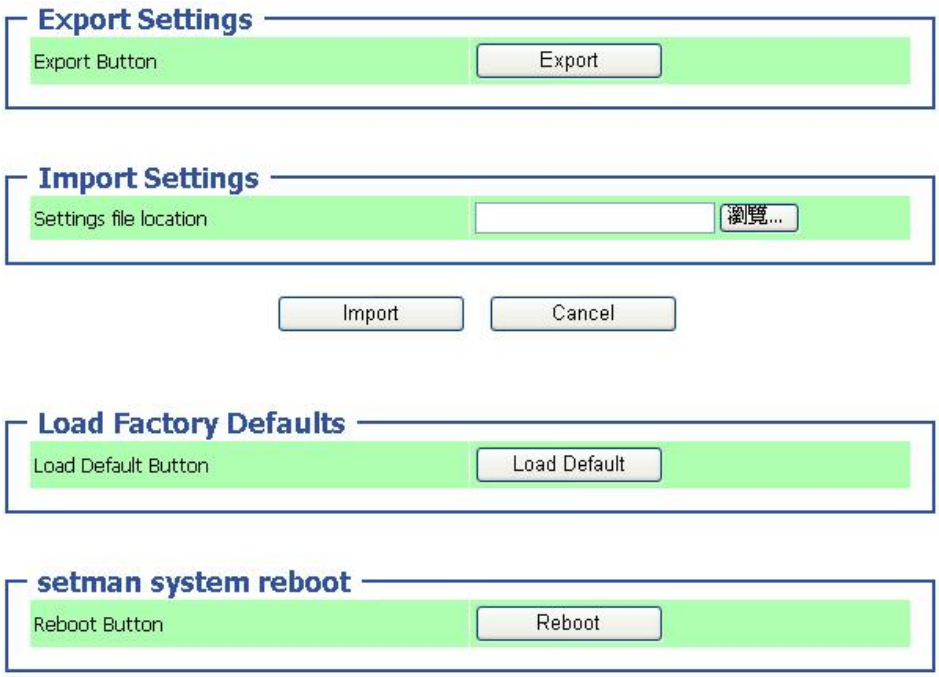


Settings

Export Button	Export AP setting to PC
Import Settings	Import AP setting file from PC
Load Default Button	Load AP Default factory settings

9.3 Firmware Update

Upgrade the firmware to obtain new functionality. It takes about 1 minute to upload upgrade flash and be patient please. Caution! A corrupted image will hang up the



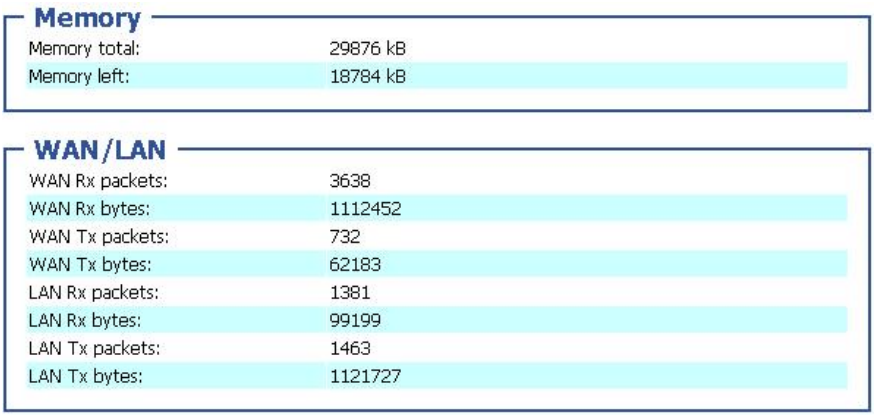
system.

Firmware Update

Update Firmware	Update Firmware file from PC
Update firmware from USB	Update Firmware from USB storage
Update Boot loader	Update AP boot loader from PC
Update Firmware via mem	Update Firmware via memory write to flash

9.4 Statistic

This chapter will display memory and WAN port, LAN port status.



Statistic

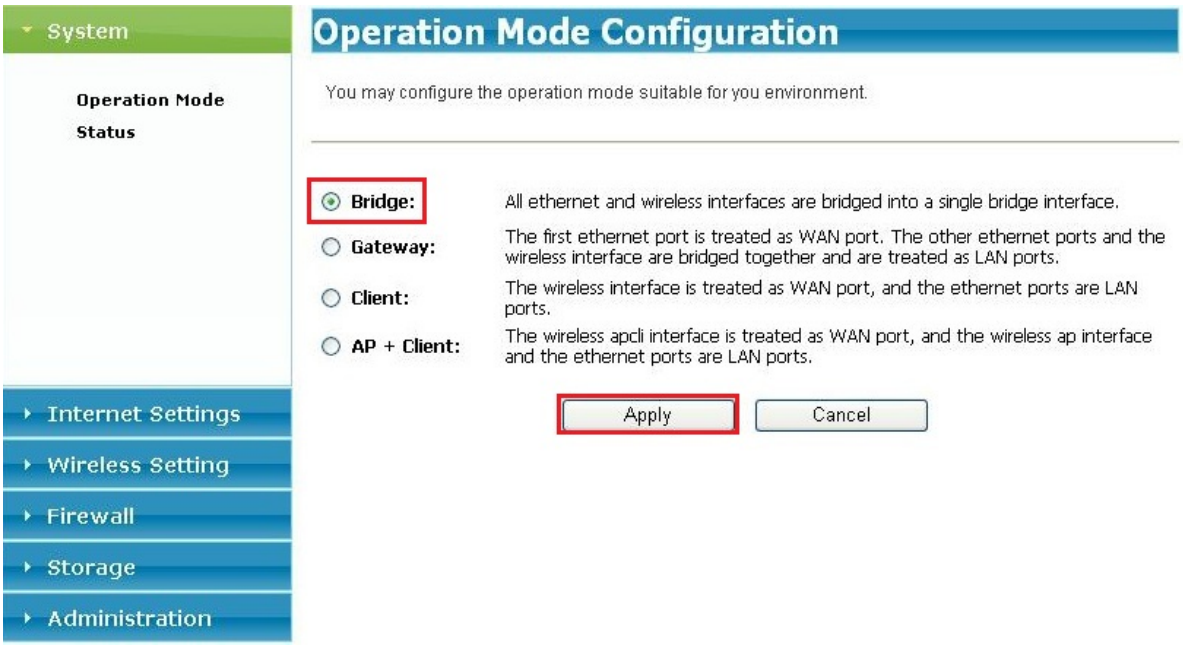
Memory total	AP Router memory total quantity
Memory left	Memory left quantity
WAN Rx packets	WAN port receive packets quantity
WAN Rx bytes	WAN port receive data quantity
WAN Tx packets	WAN port transmit packets quantity
WAN Tx bytes	WAN port transmit data quantity
LAN Rx packets	LAN port receive packets quantity
LAN Rx bytes	LAN port receive data quantity
LAN Tx packets	LAN port transmit packets quantity
LAN Tx bytes	LAN port transmit data quantity

Chapter 10 Bridge mode

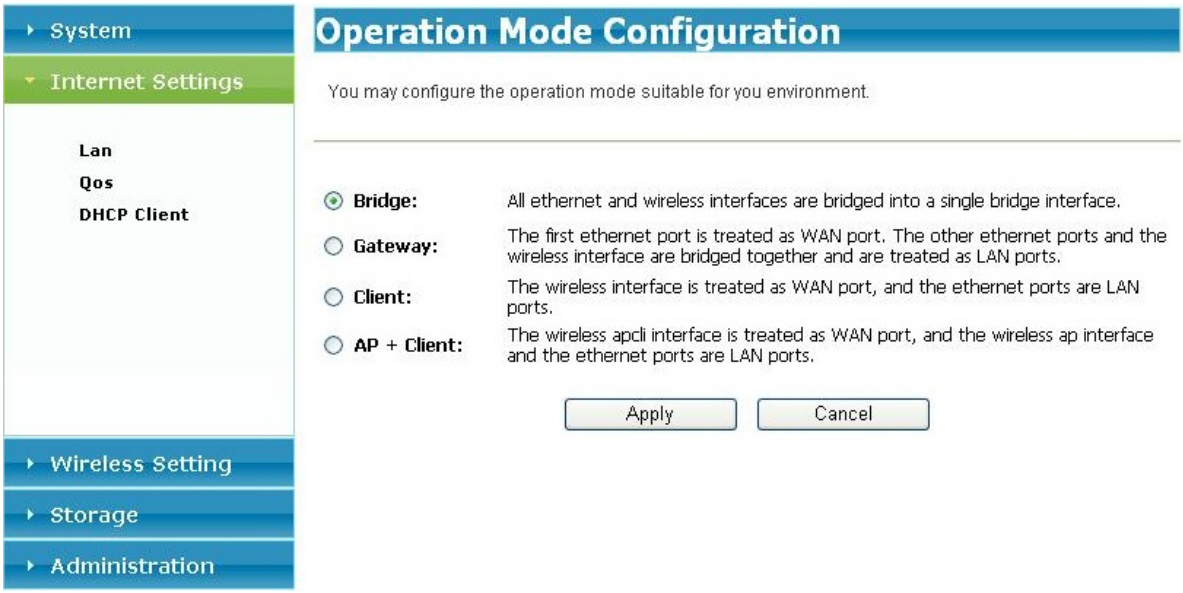
Bridge mode Ethernet and wireless interfaces are bridged into a single bridge interface.

Bridge mode configuration：

Select “Bridge”→click ”Apply” Then Bridge mode will work.


System
Operation Mode
Status
Internet Settings
Wireless Setting
Firewall
Storage
Administration
Operation Mode Configuration
You may configure the operation mode suitable for you environment.
Bridge:
All ethernet and wireless interfaces are bridged into a single bridge interface.
Gateway:
The first ethernet port is treated as WAN port. The other ethernet ports and the wireless interface are bridged together and are treated as LAN ports.
Client:
The wireless interface is treated as WAN port, and the ethernet ports are LAN ports.
AP + Client:
The wireless apcli interface is treated as WAN port, and the wireless ap interface and the ethernet ports are LAN ports.
Apply
Cancel

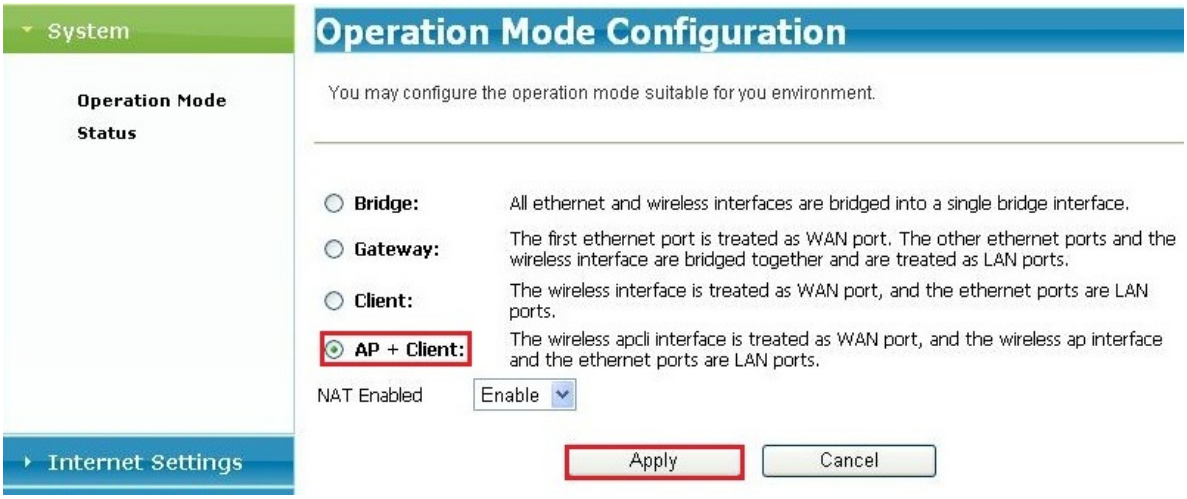
Bridge mode does not have **WAN** Function. Other setting same to Gateway mode.


System
Internet Settings
Lan
Qos
DHCP Client
Wireless Setting
Storage
Administration
Operation Mode Configuration
You may configure the operation mode suitable for you environment.
Bridge:
All ethernet and wireless interfaces are bridged into a single bridge interface.
Gateway:
The first ethernet port is treated as WAN port. The other ethernet ports and the wireless interface are bridged together and are treated as LAN ports.
Client:
The wireless interface is treated as WAN port, and the ethernet ports are LAN ports.
AP + Client:
The wireless apcli interface is treated as WAN port, and the wireless ap interface and the ethernet ports are LAN ports.
Apply
Cancel

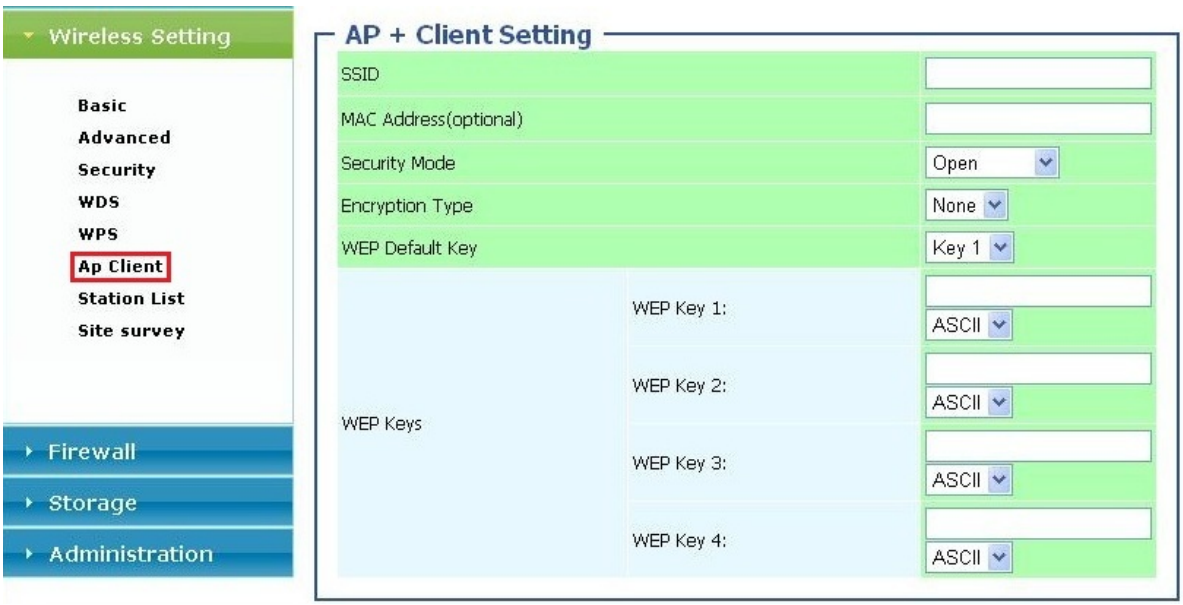
Chapter 11 AP + Client

AP +Client mode wireless apcli interface is treated as WAN port, and the wireless AP interface and the Ethernet ports are LAN ports.
AP +Client mode wireless apcli interface only work with wireless AP interface ra0, This mean one SSID can by through apcil to connect internet.

AP +Client mode configuration：
Select “AP + Client”→click “Apply”


System
Operation Mode
Status
Internet Settings
Operation Mode Configuration
You may configure the operation mode suitable for you environment.
Bridge:
All ethernet and wireless interfaces are bridged into a single bridge interface.
Gateway:
The first ethernet port is treated as WAN port. The other ethernet ports and the wireless interface are bridged together and are treated as LAN ports.
Client:
The wireless interface is treated as WAN port, and the ethernet ports are LAN ports.
AP + Client:
The wireless apcli interface is treated as WAN port, and the wireless ap interface and the ethernet ports are LAN ports.
NAT Enabled
Enable
Apply
Cancel

Select “Wireless Setting”→click “AP client” show that configuration page.



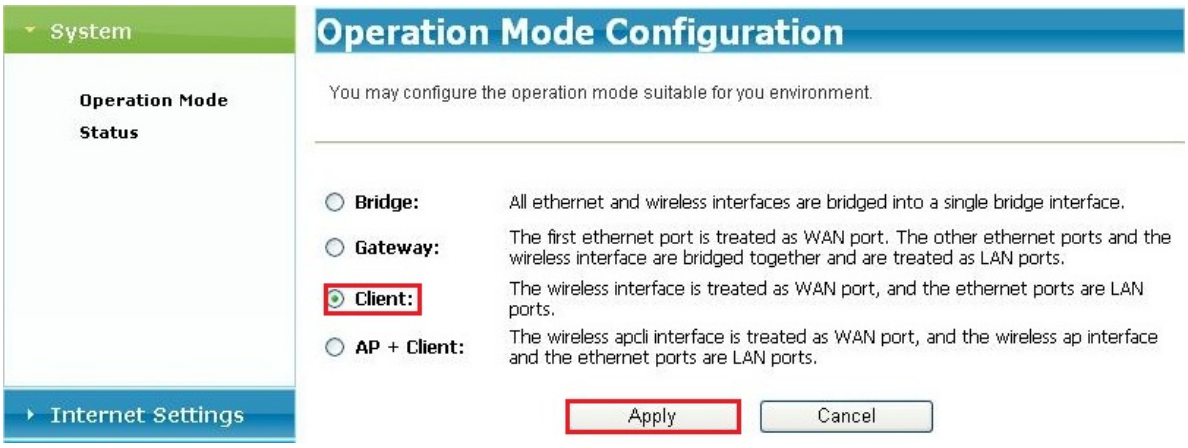
Field input SSID name in SSID or input MAC Address wanted to link in MAC Address. Can be chosen the Wireless Security in the page.

Chapter 12 Client

Client mode The wireless interface is treated as WAN port, and the Ethernet ports are LAN ports. Client mode can let AP become Wireless client but DHCP Server needs enable.

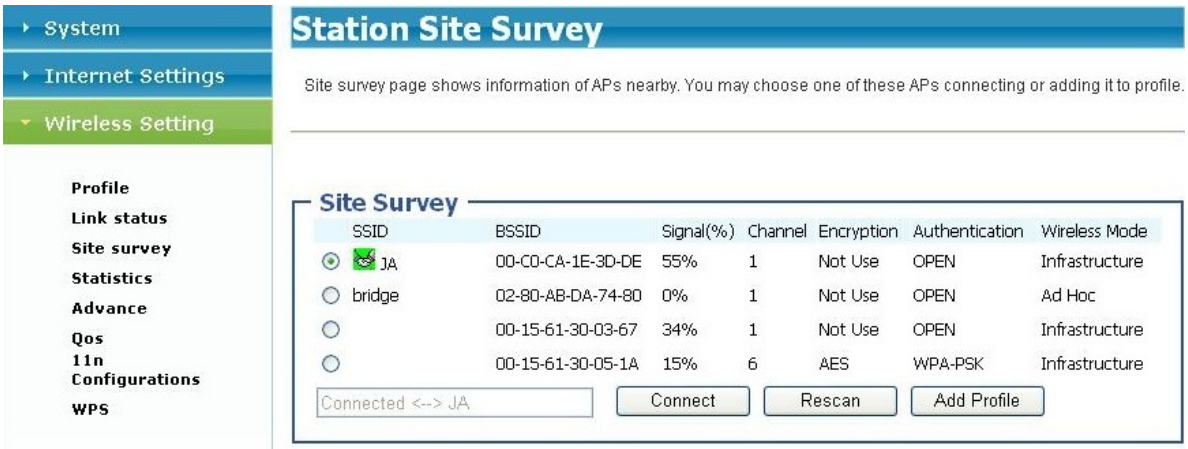
Client mode configuration：

Select “Client”→click “Apply”

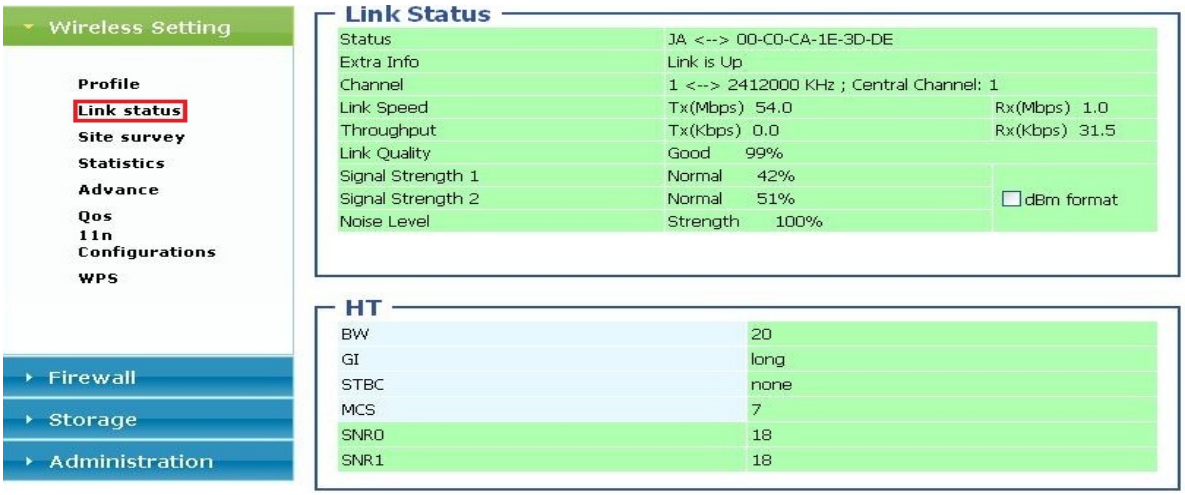

System
Operation Mode
Status
Internet Settings
Operation Mode Configuration
You may configure the operation mode suitable for you environment.
Bridge:
All ethernet and wireless interfaces are bridged into a single bridge interface.
Gateway:
The first ethernet port is treated as WAN port. The other ethernet ports and the wireless interface are bridged together and are treated as LAN ports.
Client:
The wireless interface is treated as WAN port, and the ethernet ports are LAN ports.
AP + Client:
The wireless apcli interface is treated as WAN port, and the wireless ap interface and the ethernet ports are LAN ports.
Apply
Cancel

Select “Wireless Setting”→click “Site survey” show that configuration page.

Site Survey page can scan AP signal. Choose SSID wanted to link to connect.



Link Status can show Wireless connect status and confirms connect result.



Profile can be configuration manually Wireless and Wireless security.